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Occupational Analyses Series

Motor Vehicle Body Repairer



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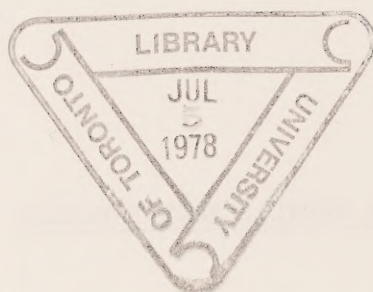
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Interprovincial
Analysis

MOTOR VEHICLE BODY REPAIRER

Canada Employment and Immigration Commission
La Commission de l'Emploi et de l'Immigration du Canada

OTTAWA
1978



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This analysis was prepared in the Occupational and Career Analysis and Development Branch under the direction of L.G. Dixon, Manager, Occupational Analysis and Classification Systems. General direction was provided by D.S. Conger, Director, Occupational and Career Analysis and Development Branch.

The planning and execution of the analysis were performed by M.T. Bennett and C.E. Kaisin, Senior Occupational Analysts under the supervision of F.R. Bertrand, Chief, Classification and Description Systems.

This analysis covers tasks found in occupations having the following names as identified by the different provinces and territories of Canada:

autobody repairer
body-and-fender repairer
body repairer
motor vehicle body repairer

Disponible en français sous le titre
"DEBOSSELEUR - PEINTRE"

THE FOLLOWING OCCUPATIONAL/TRADE ANALYSES
ARE CURRENTLY AVAILABLE

Aquaculture Technician
Boilermaker
Bricklayer and Stonemason
Carpenter
Construction and Industrial Electrician
Cook
Hair Grooming
Heating (Gas and Oil) Servicer (Commercial and Industrial)
Heavy Duty Equipment Mechanic
Industrial Mechanic (Millwright)
Interior Wall and Ceiling Finisher
Ironworker
Lineman
Machinist
Major Appliance Repairer
Manpower Counsellor
Motor Vehicle Body Repairer
Motor Vehicle Mechanic
Oil Burner Mechanic (Residential)
Painter and Decorator
Plumber, Steamfitter, Pipefitter and Sprinkler Installer
Power Engineer (Stationary Engineer)

Radio and Television Service

Refrigeration and Air-Conditioning Mechanic

Sheet Metal Worker

Welder

Wood Cabinet and Furniture Maker

FOREWORD

The first National Conference on Apprenticeship in Trades and Industries held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end the federal Department of Manpower and Immigration sponsored a program, under the guidance of the Interprovincial Standards Program Co-ordinating Committee, to develop a series of trade analyses.

The trade Analysis Program has the following objectives:

- to identify the tasks performed by a journeyman in a particular trade;
- to obtain interprovincial acknowledgement that the tasks stated in the trade analysis are applicable to journeymen in every province;
- to develop an instrument for use in the preparation of inter-provincial standards examinations (Interprovincial "Red Seal"), and in the preparation of curricula for instruction leading to the journeyman qualification;
- to facilitate the mobility in Canada, of journeyman holding certificates with Interprovincial Seal which is recognized by all provinces and territories;
- to supply government, employers, unions, training institutions and members of the labour force with an exhaustive list of tasks in a particular occupation, which they can readily assess and utilize in such operations as job information and placement, assessment of training needs, occupational inquiries, and immigration selection.

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GUIDE TO THE ANALYSIS

SCOPE OF THE ANALYSIS

For the purpose of this analysis, a Motor Vehicle Body Repairer is a skilled worker who, repairs damaged body parts and interior finishings of automotive vehicles.

Written in behavioural terms, the Analysis outlines the tasks and sub-tasks that a qualified Motor Vehicle Body Repairer would expect to perform with proficiency anywhere in Canada. It should be noted, however, that the occupation will vary depending if he is self-employed or working for automobile dealers and repair shops.

Note: The body of the analysis is limited by its terms of reference to a description of "work performed" in the Motor Vehicle Body Repairing Occupation, and omits identification of other factors such as aptitudes and capacities, interests and temperaments and the conditions under which the worker performs his duties. These data have been included in the form of appendices, not as a constituent part of the analysis but rather as a by-product, with the thought that such information may be useful to those agencies responsible for the development of training programs and counselling.

PREPARATION OF THE ANALYSIS

A draft analysis of the Motor Vehicle Body Repairing occupation was originally prepared by a selected panel made up of persons having extensive knowledge and experience in this trade.

This draft analysis was then assigned to occupational analysts of the Canada Employment and Immigration Commission for review and edit in conformity with the nationally approved format.

Copies of the revised analysis were then presented to provincial and territorial authorities who reviewed it, drawing upon skilled resource persons within their respective jurisdictions to comment on the content of the analysis. These comments were reviewed and, when required, amendments have been made to the analysis. This analysis therefore meets with provincial and territorial approbation and is in conformance to the standards set by the Interprovincial Committee on occupational analysis. The final draft has been translated and printed in both official languages of Canada.

STRUCTURE OF THE ANALYSIS

Divisions of the Analysis

To facilitate understanding of the nature of the occupation, the work performed is divided into the following constituent parts or "Divisions".

- A. BLOCK - is a major division reflecting a distinct operation within the occupation.
- B. TASK - which contains several sub-tasks, is one of the distinct activities that make up the logical and necessary steps in the performance of work by the worker, and constitutes a specific assignment within a block of the occupation being studied.
- C. SUB-TASK - is the smallest step into which it is practicable to sub-divide any work activity.

Ratings in the Analysis

Each task in the analysis is rated for the following factors:

- A. The proportion of work force actively engaged in performing the task;
- B. The frequency of task performance;
- C. The acceptable standard of quality in performing the task which is left to the discretion of each province or territory.

The first and second factors are combined into the Proportion of Work Force and Frequency of Activity Ratings, using a two symbol alpha-numeric code. For example;

B3 - the alphabetic symbol indicates the proportion of the work force engaged in the activity and the numeric symbol the frequency of the activity. With the code there should be a brief explanatory statement to substantiate the assigned rating. B3 - specialization and small demand, task performed by 50% to 75% of the work force, more than once a week.

It must be remembered in considering these ratings for a particular occupation that in fact what is recorded is the average proportion of the work force engaged in each task, the average frequency with which each task is performed, and the minimum acceptable standard of task performance. It is to be understood throughout the analysis that the worker is expected to complete each task within a reasonable period of time, with a minimum waste of materials. These ratings, "Proportion of Work Force" and "Frequency of Activity" should be interpreted as indicated in the following tables.

<u>Proportion of Work Force Code</u>	<u>Frequency of Activity Code</u>
A - 75% or more of the work force	5 - MORE than once an hour
B - between 50% and 75% of the work force	4 - MORE than once a day
C - between 25% and 50% of the work force	3 - MORE than once a week
D - 25% or less of the work force	2 - MORE than once a month
	1 - MORE than once a year

PERFORMANCE STANDARDS

Performance standards are not provided. These ratings are left to the discretion of users of the analyses as in many occupations or trades there are no set norms to identify performance standards.

ENABLING OBJECTIVE

That element of skill and knowledge that an individual must acquire to enable him/her to perform the task adequately.

TREND

Under this heading in the analysis, information regarding the following is to be outlined.

- a) any shifts or changes in technology that affects the sub-tasks.

Example - in the Plumbing Trade, the introduction and acceptance of plastic piping (PVC) is a trend that is evolving. A statement to this effect should be developed and placed under the heading TREND for the task covering piping and tubing installation.

- b) any shifts or changes in the occupational organization of the sub-tasks.

Example - in the Carpentry Trade, stairways are often prefabricated in a shop environment by specialized workers and transported to the job site. A statement to this effect should be developed and placed under the heading TREND for the task covering construction of wooden stairways of various types.

If there are no known shifts or changes in technology or in occupational organization, no entry is to be made under this heading.

MOTOR VEHICLE BODY REPAIRER

FORECAST OF OCCUPATIONAL DEMAND IN CANADA TO 1982

CCDO Code	Description	Demand		1974 - 1982		Withdrawals	Required Supplies	
		1974	1982	Net Change	% of 1974		1974 - 1982	% of 1974
8581	Motor Vehicle Mechanics	136,300	164,525	28,225	20.71	31,425	59,650	43.76

DEFINITIONS

Demand: the number of positions required to be filled at a given point in time to ensure that the economy will continue to pertain a medium-term growth trend close to full potential as defined by the Economic Council of Canada.

Withdrawals - Deaths: the number of job-openings which become available over the reference period due to withdrawals from the labour force and the death of labour force members.

Net Change: the change in demand between any two reference points in time equals net change. In this table, the reference points are 1974 and 1982, and the forecasts of net change represent those new job-openings which will become available over the reference period.

Required Supplies: the sum of net changes, withdrawals and deaths equals required supplies. These forecasts represent the total number of job-openings available over the reference period from all causes.

Source: Canadian Occupational Forecasting Program (no. 1)

Forecasts of Occupational Demand to 1982
(Information Canada Catalogue no. MP52-3/75)

In Percentage of 1974: both required supplies and net changes have been expressed as a percentage of the demand in 1974.

SPECIAL NOTES

Additional Sources of Information

Additional information concerning the auto-body repairing occupation may be found in:

- a) Canadian Classification and Dictionary of Occupations (1971) Volumes I and II: Unit group 8581 - Motor Vehicle Mechanics and Repairmen.
- b) International Standard Classification of Occupations (1969): Unit group 8.73, occupational category 70: Body Repairmen, Vehicles.
- c) United Kingdom Classification of Occupations and Directory of Occupational Titles: Unit Group 742, occupational category 742, 20 Motor Mechanic.
- d) United States Dictionary of Occupational Titles (1965): Structural work occupations - 807.381, Automobile Body Repairman.
- e) Occupational Outlook Handbook (1974-75), Other Mechanics and repairmen division, Automobile Body Repairmen (D.O.T. 807.381).

Gender of Terms

For the purpose of this analysis, masculine terms shall be considered as either masculine or feminine in meaning.

Specialties

Upholstering, electrical wiring, front-end alignment and air-conditioning work is often referred to speciality shops, particularly in larger centres. In some smaller shops, all or part of this work is still being done by the motor vehicle body repairer. At any rate, a skilled tradesman should be knowledgeable and aware of some of the problems relevant to repair requirements related to the above areas.

Safety and Fire Hazards

An important quality required of a proficient worker in this trade is a constant awareness of safety standards when handling tools and materials. Some equipment, particularly power tools and applicators require special skills to operate. Equally important is a strict adherence to local fire regulations, especially when handling and applying cleaning and painting materials.

THE ANALYSIS

BLOCK A ANALYSIS AND ESTIMATE - CONVENTIONAL REPAIRS

Task 1 Analyses damage to the conventional frames, unitized bodies, sub-frames and underbodies.

Activity Measure: (A3) - 75% or more of the work force perform this task more than once a week.

Activity Measure: (C2) - less than 50% but more than 25% of the work force perform this task more than once a month.*

Trend: In the larger cities, frame and underbody, or unitized body repair and alignment is being done extensively, but not exclusively, by frame shops. Due to this, two activity measures exist; C2, which is applicable to frame repair in body shops only, and A3, which is applicable to frame repair in specialized frame shops only.

Sub-tasks	Enabling Objectives	Tools & Equipment
1.01 Performs a visual inspection and examines frame or unitized body to determine the extent of damage and type of vehicle construction.	knowledgeable in the assembly and structure of vehicle frames and unit bodies	
1.02 Determines the pertinent details of the vehicle frame or unit body construction by consulting the manufacturers frame and body dimensions in an applicable frame manual, in conjunction with corresponding inspections to the vehicle.	knowledgeable in the assembly and structure of: <ul style="list-style-type: none">- various types of frames- unitized body sub-frames	frame manual charts diagrams
1.03 Examines and studies: <ul style="list-style-type: none">- damaged frame and underbody or unitized body parts and related areas to determine the direction of force causing the damage;- determines the directions of force to be applied for straightening and	knowledgeable in how to determine: <ul style="list-style-type: none">- direction of damaging force- location of direct and indirect hidden damage- location of ridges, channels and sub structures	frame manual charts diagrams

Sub-tasks	Enabling Objectives	Tools & Equipment
aligning the frame and underbody or unitized body parts (assemblies); - determines if the frame and underbody or unitized body is repairable or if replacement is required.	- effects of collision or fire damage - effects of rust (corrosion) damage - if vehicle is restorable (repairable) to the original strength, shape and function	
1.04 Estimates time and cost of repairs.	the skill and experience of a proficient journeyman mechanic in the repair, replacement, straightening and alignment of frames, underbody or unitized body is required to enable estimating of repair costs (parts and labour)	labour flat rate manual parts catalogue & price list frame manual
1.05 Measures & marks reference points on frame, underbody or unitized body, for measurement of the horizontal & vertical diagonals.	knowledgeable in: - structure of various types of vehicle frames and unitized bodies - reading related diagrams - determining method of measuring - determining location for marking reference points for measurement of horizontal and vertical diagonals - determining and using the applicable measuring device for marking the prescribed reference points	frame manual charts diagrams marking crayon or chalk steel tape & tram gauge datum-line gauges centering gauges
1.06 Checks for misalignment of frame, underbody, or unitized body, by measuring with tools and equipment such as steel tape & tram gauge, self centering gauges, datum-line gauges, rack-type frame &	knowledgeable in: - structure of the various types of vehicle frames and unitized bodies - reading of related diagrams	steel tape & tram gauge self centering gauges datum-line gauges rack-type frame

Sub-tasks	Enabling Objectives	Tools & Equipment
body press, or portable aligning unit for checking measurement of diagonals (X checking) and other frame or unitized body dimensions.	<ul style="list-style-type: none"> - determining reference markings (points) on vehicle - diagnosis of misalignment - methods for measuring various types of misalignment (datum-line method of checking alignment) - operating (using) the applicable equipment, gauges or other devices for measuring misalignment (checking alignment) 	& body press or portable aligning unit
1.07 Records the results of diagonal checks and other dimensions for correction of misalignment.	proficient in recording a practical reference of the results of frame and unitized body misalignment checks (measurements)	work pad & pencil
1.08 Studies results of misalignment checks and prepares a sequential work plan for repairing damage and correcting misalignment in the frame, underbody, or unitized body.	knowledge of how to prepare a methodical sequential work plan in the form of a practical drawing and written sequential instructions or in the form of verbal instructions	frame manual, charts, and diagrams parts catalogue work pad, pencil, and drawing tools

Performance Standard: to be completed by the user (see not on page xvi)

Task 2 Replaces, repairs, straightens and aligns the conventional frame, unitized body sub-frame and/or underbody.

Activity Measure: (A3) - 75% or more of the work force perform this task once a day or less but more than once a week.*

Activity Measure: (C3) - between 25% and 50% of the work force perform this task more than once a week.*

Trend: *In the larger cities, frame and underbody, or unitized body repair and alignment is being done extensively, but not exclusively, by frame shops. Due to this, two activity measures exist; C2, which is applicable to frame repair in body shops only, and A3, which is applicable to frame repair in specialized frame shops only.

Sub-tasks	Enabling Objectives	Tools & Equipment
2.01 Reviews work plan for repairing and straightening frame, underbody, or unitized body.	ability to read and understand and apply practical drawings and written instructions (or verbal instructions)	
2.02 Co-ordinates the repair, straightening, and alignment of frame, underbody, or unitized body with other related vehicle repairs and alignments such as; front and/or rear suspension, steering mechanism, and body repairs.	knowledgeable in: <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods of co-ordinating frame or unitized body sub-frame repair with other related repairs to the vehicle (body, steering, suspension or mechanical) 	frame, body and mechanical manuals
2.03 Marks reference points on frame, underbody, or unitized body for placing fixtures to apply holding, pushing, or pulling forces, and heat for straightening.	knowledge in: <ul style="list-style-type: none"> - understanding the directions of damaging forces to frame or unitized body - ability to transform this aforementioned knowledge into marking the correct locations on frame, or unitized body to mount the fixtures for applying straightening action (force) and heat 	

Sub-tasks	Enabling Objectives	Tools & Equipment
2.04 Positions vehicle frame or underbody in either a fixed (rack-type) or a portable frame and unitized body straightener and aligner. Attaches holding fixtures to frame and adjusts holding pressure according to type and extent of straightening required.	proficient in: - operating fixed and portable alignment equipment - installing holding fixtures and applying correct holding pressure	fixed or portable type frame & unitized body straightener & aligner pushing & pulling rams jacks & fixtures oxy-acetylene welding torch electric welder
2.05 Attaches straightening fixtures to the marked location on frame, underbody, or unitized body by means of clamping, welding, bolting and/or chaining.	proficient in methods of attaching straightening fixtures	clamps, bolts, and/or chains oxy-acetylene welding torch electric welder
2.06 Operates controls to apply sufficient pulling and/or pushing pressure to straighten frame, underbody, or unitized body, to correct dimensions and alignment.	skilled in: - operating hydraulic or pneumatic units for straightening - determining the amount of force for straightening	pushing & pulling rams jacks & fixtures
2.07 Applies controlled heat to severely bent areas of the frame or underbody to enable straightening of frame, underbody, or unitized body, to the original shape and dimensions.	knowledgeable and skilled in: - behavior of metal when heat is applied - effects of applied heat on the structural strength of metal - applying controlled heat with a oxy-acetylene torch in straightening severely bent areas of frame or unitized body	oxy-acetylene torch
2.08 Repairs damaged frame, cross members, sub-frame, or unitized underbody	skilled in: - oxy-acetylene and electric welding	electric welder oxy-acetylene torch

Sub-tasks	Enabling Objectives	Tools & Equipment
parts by welding, applying working the weld and metal by hammering.	<ul style="list-style-type: none"> - preventing hardening weld areas by hammering - working and reshaping metal with applicable hammers and dollies - replacing rivets 	large ball peen body hammers dollies small sledge hammer rivetting tool
2.09 Removes irreparable frame, cross members, sub-frame, and/or unitized underbody parts, by unfastening bolts, rivets, and retainment parts, by drilling out spot welds and by cutting at the replacement location.	proficient in the method of removing frame and unitized body structures and in the use of metal cutting and detaching tools and equipment	ratchet & sockets wrenches drill & bits power metal cutting tool oxy-acetylene cutting torch hack saw hammer & chisel
2.10 Positions (aligns), fits and installs replacement frame, crossmembers, sub-frame and/or unitized body parts, by holding with bolts, clamps and other fixtures, tack or spot welds, and then secures the installation by riveting, bolting, and welding joints and seams. Where applicable, applies sealing material to joints and seams of underbody and/or unitized body parts.	skilled in method of: <ul style="list-style-type: none"> - using the applicable tools and equipment for fitting and securing the installation of the replacement frame, cross member, sub-frame and/or unitized body parts - holding the replacement frame, cross members, sub-frame and unitized underbody parts in correct position and alignment before securing the installation 	power metal cutting tool hack saw aligning tools (taper punches) oxy-acetylene torch clamps drill & riveting tool holding fixture bolts rivetting tool ratchet & sockets wrench set oxy-acetylene welding torch electric welder sealing material applicator
2.11 Rechecks frame, underbody, and/or unitized body	knowledgeable in: <ul style="list-style-type: none"> - methods for 	steel tape & tram gauge

Sub-tasks	Enabling Objectives	Tools & Equipment
alignment (dimensions). Applies further straightening action if required.	measuring the various types of misalignment (datum-line method of checking alignment) - operating (using) the applicable equipment, gauges or other devices for measuring misalignment (checking alignment) skilled in: - operating hydraulic or pneumatic units for straightening - determining the amount of force for straightening	self centering gauges datum-line gauges rack-type frame & body press or portable aligning unit pushing & pulling rams jacks & fixtures
2.12 Repaints repaired areas with rust resistant frame and underbody paint.	skilled in: - using the applicable tools and equipment for removing scale, rust, and residue from the repaired areas in preparation for painting - applying frame and underbody paint with a paint spray gun or aerosol can	chisel scraper wire brush portable grinder buffer & sander aerosol paint paint spray gun & air compressor

Performance Standard: to be completed by the user (see note on page xvi)

BLOCK B QUARTER, TRUNK, FLOOR AND ROOF PANELS AND ASSEMBLIES

Task 3 Repairs (restores) or replaces damaged quarter panel.

Activity Measure: (B3) - between 50% and 75% of the work force perform this task more than once a week.

Trend: Trade continues with sheet metal repair forming the major portion of the auto body repair trade. Note - the application of body solder for filling dents and creases is no longer used by most of the auto & truck body mechanics; the present method used by most of the auto & truck body mechanics for filling dents is done with the application of plastic and epoxy type fillers.

Sub-tasks	Enabling Objectives	Tools & Equipment
3.01 Analyses direct and/or indirect collision damage and/or rust (corrosion) damage to the panel, to determine if the panel is restorable (repairable) to its original strength, shape and function or if replacement is required.	knowledgeable in determining: - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage - location and types of inner construction	
3.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal (panel)	labour flat rate manual parts catalogue & price list body & frame manual
3.03 Makes panel accessible for repair or removal, by removing interior hardware, trim and interfering parts; by removing exterior mouldings chrome trim, name plates, light assemblies, full tank cap cover/door & filler neck, side and/or rear window and other obstructing (interfering) parts.	skilled in using the applicable tools for removal of hardware & trim parts & materials; knowledgeable in care and storage of trim, hardware and glass; knowledgeable of sealants and method used in replacement of rear window glass	trim removal tools mechanics tools: sockets, wrenches, screw drivers, allen-wrenches & pliers

Sub-tasks	Enabling Objectives	Tools & Equipment
3.04 Co-ordinates quarter panel repair and/or replacement with the related body, frame and underbody repairs and alignments.	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods for co-ordinating body panel repair with other related repairs to the vehicle frame, unitized body and underbody or mechanical component 	<p>frame, body, and mechanical manuals</p>
3.05 Removes irreparable panel by cutting metal and/or detaching spot welds at the replacement location (joint, seam, spot weld or a pre-measured mark).	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - quarter panel and body structure, - methods of panel removal by the use of the predescribed tools and equipment, - elimination of all fire hazards 	<p>power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch hand shears drill & bits for drilling out welds</p>
3.06 Positions (aligns), fits and installs replacement panel by means of securing with clamps, tack or spot welding, or pop rivets; welding or brazing joints and seams; and where applicable applies body solder and/or sealing material to joints and seams; tests for air and water leakage.	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - quarter panel and body structure - how to measure the applicable diagonals to facilitate correct alignment of the installation - following pre-described methods of securing and completing the installation of the panel - proper types of weld joints <p>skilled in:</p> <ul style="list-style-type: none"> - oxy-acetylene welding and brazing - arc-spot welding of thin-gauge metal 	<p>clamps electric welder spot welder oxy-acetylene welder rivetting tool drill & bits leading tools steel wool paddles body file disc grinder compressed air water hose</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
3.07 Straightens and aligns damaged areas of the panel using pushing & pulling equipment & applicable fixtures, bump hammering, and/or applying heat to severely bent areas to assist the straightening process.	<p>skilled in:</p> <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment & fixtures - methods of connecting attachments for pulling, pushing and holding - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of body panel 	<p>portable unitized body straightener slide hammer metal puller & attachments push & pull ram or porto-power with fixtures, clamps and suction cup type metal pulling attaching fixture bumping hammer body hammers and dollies spoons oxy-acetylene torch</p>
3.08 Restores original shape to the damaged area of panel by working metal with various types of body metal hammers and dollies; welding or brazing patches, cracks and tears; applies heat to shrink stretched areas of the panel; grinds and files surface to insure proper shape of panel.	<p>skilled in:</p> <ul style="list-style-type: none"> - methods for working and re-shaping sheet metal panels with applicable hammers and dollies - oxy-acetylene welding and brazing - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander with the correct pressure and angle for restoring original shape to the metal - filing sheet metal panels with the correct pressure and angle for restoring original shape to the metal 	<p>portable disc grinder & sander oxy-acetylene torch pick hammer dinging hammer square face hammer molding hammer wedge shaped hammer spoons (surfacing & others) low crown dollies high crown dollies roughing dolly anvil dolly slapping file body file</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
3.09 Restores original shape to outer surface of the panel by applying hot or cold filler to dents, creases or low areas which are not accessible for straightening; files and sands panel to insure proper shape and condition of surface for painting.	skilled in: - methods of applying cold type fillers with a squeegee - shaping plastic, epoxy & lead body fillers to conform with the original body shape by means of filing and sanding	oxy-acetylene torch plastic squeegee body file orbital sander disc sander hand sander

NOTE: the following tasks are completed after painting:

3.10 Replaces exterior mouldings, chrome trim, name plates, light assemblies, fuel cap cover or door, and other applicable parts.	knowledgeable in the various types of retainment for exterior trim parts and hardware, and skilled in using the applicable method and tools to install trim parts	moulding & trim tools screw drivers putting knife pliers small socket & wrench set adhesive or contact type cement epoxy
3.11 Replaces interior parts which interfered with the panel removal or repair. Replaces sound deadener material, side and/or rear window, interior trim panel and hardware.	skilled in: - application of sound deadener material - replacement of interior trim parts, hardware, side window mechanisms - replacing side and/or rear window when applicable	undercoating applicator applicable hand tools as listed in 3.10 window sealing materials

Performance Standard: to be completed by the user (see note on page xvi)

Task 4 Repairs or replaces trunk panels, trunk lid, trunk hardware, and rear bumpers. Checks for frame damage.

Activity Measure: (B3) - between 50% and 75% of the work force perform this task more than once a week (basic application of skill in repair of auto and truck body sheet metal, with a frequent demand).

Trend: Trade continues with sheet metal repair forming the major portion of the auto body repair trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
4.01 Analyses direct and/or indirect collision damage and/or rust (corrosion) damage to the trunk panels, trunk lid, and rear bumper, to determine if they are restorable to their original strength, shape and function or if replacement is required.	knowledgeable in determining: <ul style="list-style-type: none"> - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage 	
4.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal	labour flat rate manual parts catalogue & price list body & frame manual
4.03 Makes panels accessible for repair by means of removing rear bumper & arms, trunk lid, valance, gas tank, and other interfering parts; co-ordinates a frame or unitized underbody check and repair, if required. (Removes rear window if upper panel requires replacement).	skill in using the applicable tools for removing interfering parts	trim removal tools mechanics tools: sockets, wrenches, screw drivers, & pliers
4.04 Straightens and aligns damaged areas of trunk lid by means of: <ul style="list-style-type: none"> - using suitable dent pulling equipment and applicable holding methods, such as a jig or working on the trunk lid hinged to the vehicle 	skilled in: <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment & fixtures - methods of connecting attachments for pulling, pushing and holding 	panel holding jig & fixtures slide hammer metal puller & attachments push or pull ram or porto-power with fixtures, clamps, and suction cup type metal pulling attaching fixture

Sub-tasks	Enabling Objectives	Tools & Equipment
<ul style="list-style-type: none"> - bump hammering - applying heat to severely bent areas to assist the straightening process. 	<ul style="list-style-type: none"> - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with a oxy-acetylene torch in straightening severely bent areas of trunk lid 	bumping hammer body hammers dolly & spoon oxy-acet. torch
4.05 Removes irreparable panel by cutting metal and/or detaching spot welds at the replacement location (joint, seam, spot weld or pre-measured mark) with a power cutting tool, hand shear, cutting torch, drill & bit, metal saw, and/or a hammer & chisel.	knowledgeable in: <ul style="list-style-type: none"> - lower trunk panel and body structure - methods of panel removal by the use of the predescribed tools and equipment - types of weld joints 	power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch hand shears drill & bits for drilling out welds
4.06 Positions (aligns), fits and installs replacement trunk panels and floor panels by securing with clamps and tack welding; by welding and/or brazing joints and seams; and where applicable applies body solder and/or sealing material to joints and seams; tests for air and water leakage.	knowledgeable in: <ul style="list-style-type: none"> - lower trunk panel and body structure - how to measure the applicable diagnosis to facilitate correct alignment of the installation - following pre-described methods of securing and completing the installation of the panel - proper types of body seam sealers - types of weld joints 	clamps electric welder oxy-acetylene welder rivetting tool drill & bits leading tools steel wool paddles body file disc grinder compressed air water hose

Sub-tasks	Enabling Objectives	Tools & Equipment
4.07 Straightens and aligns damaged areas of the panel using pushing & pulling equipment & applicable fixtures, bump hammering, and/or applying heat to severely bent areas to assist the straightening process.	<p>skilled in:</p> <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment & fixtures - methods of connecting attachments for pulling, pushing and holding - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of trunk panel 	<p>portable unit-ized body straightener slide hammer metal puller & attachments push & pull ram or porter power with fixtures, clamps and suction cup type metal pulling attaching fixture bumping hammer body hammers dolly & spoon oxy-acetylene torch</p>
4.08 Restores original shape to the damaged area of trunk panel and/or lid by working metal with various types of body metal hammers and dollies, welding or brazing patches, cracks and tears; applies heat to shrink stretched areas of the panel; grinds and files surface to insure proper shape of panel and/or lid.	<p>skilled in:</p> <ul style="list-style-type: none"> - methods for working and reshaping sheet metal panels with applicable hammers and dollies - oxy-acetylene welding and brazing - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander with the correct pressure and angle for restoring original shape to the metal - filing sheet metal panels with the correct pressure and angle for restoring original shape to the metal 	<p>portable disc grinder & sander oxy-acetylene torch pick hammer dinging hammer square face hammer molding hammer wedge shaped hammer spoons (surfacing & others) low crown dollies high crown dollies roughing dolly anvil dolly slapping file body file</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
4.09 Restores original shape to outer surface of the trunk panels and/or lid by applying hot or cold filler to dents, creases or low areas which are not accessible for straightening; files and sands trunk panels and/or lid to insure proper shape and condition of surface for painting.	<p>skilled in:</p> <ul style="list-style-type: none"> - methods of applying cold type fillers with a squeegee or with other means - methods for tinning dents in body metal with tinning compound & steel wool - applying & shaping hot body solder (lead) with oxy-acetylene torch and hardwood leading paddles - shaping plastic, epoxy & lead body fillers to conform with the original body shape by means of filing and sanding 	<p>oxy-acetylene torch leading paddles steel wool plastic squeegee body file orbital sander disc sander hand sander trowel putty knife</p>
4.10 Installs trunk lid hinges, lock, striker, weather seals and other hardware.	<p>skilled in aligning and installing the pre-described trunk lid parts, and in proper method of handling hinge springs & torsion bars</p>	<p>ratchet sockets wrenches pliers screw drivers adhesive applicator</p>
4.11 Installs and aligns repaired or replacement trunk lid, adjusts striker to latch (lock) engagement.	<p>skilled in:</p> <ul style="list-style-type: none"> - replacing and aligning trunk lids - adjusting striker and lock mechanisms 	<p>ratchet sockets wrenches pliers screw drivers</p>
4.12 Reinstalls (replaces) fuel tank, fuel tank retaining hardware, fuel lines, filler neck and fuel cap cover/door.	<p>skilled in installing fuel tanks, lines, filler and retainment hardware. Knowledgeable in safe handling and storage of gas</p>	<p>applicable equipment and mechanics tools</p>
4.13 Measures and tests energy (impact) absorbing bumper mountings and mechanisms, and replaces if damaged.	<p>skilled in:</p> <ul style="list-style-type: none"> - measuring energy absorbing bumper mountings with a measuring tape - testing condition of E.A. mountings by applying applicable pressure 	<p>measuring tape porto-power unit pressure reading hydraulic jack</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
4.14 Installs and aligns bumper arms, bumper, and valance.	skilled in the re-assembly, installation, and alignment of bumpers, bumper arms, and valances	applicable equipment and mechanics tools measuring tape
4.15 Replaces trim, ornamentals, and rear window (after re-painting, if applicable); sealing trim and ornamental holes.	knowledgeable in the various types of retainment for exterior trim parts and hardware, and skilled in using the applicable method and tools to install trim parts and window	moulding and trim tools applicable mechanics tools window sealing applicator

Performance Standard: to be completed by the user (see not on page xvi)

Task 5 Repairs or replaces floor panels and/or rocker panels.

Activity Measure: (C3) - between 25% and 50% of the work force perform this task more than once a week (basic application of skill in the repair of auto and truck body sheet metal, with infrequent demand).

Trend: Trade continues with sheet metal repair forming the major portion of the auto body repair trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
5.01 Analyses the direction and extent of collision damage or rust (corrosion) damage to determine if the floor and/or cover panels are restorable (repairable) to their original strength, shape, and function, or if a replacement is required.	knowledgeable in determining: <ul style="list-style-type: none"> - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage 	

Sub-tasks	Enabling Objectives	Tools & Equipment
5.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal	labour flat rate manual parts catalogue & price list body & frame manual
5.03 Makes floor and/or rocker panel accessible for repair or removal by removing seat assemblies, seat belts, carpets, sill cover (trim), and other interfering parts (electrical wiring).	skilled in using the applicable tools for removal of hardware & trim parts & materials. Knowledgeable of location and safe handling of electrical wire harness	trim removal tools applicable equipment and mechanics tools
5.04 Co-ordinates floor and/or rocker panel repair or replacement with related body, frame, and underbody repairs and alignments.	knowledgeable in: <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods for co-ordinating floor and/or rocker panel repair with other related repairs to the vehicle frame, unitized body and underbody or mechanical component 	frame, body, and mechanical manuals
5.05 Removes irreparable panels by cutting metal at the replacement location (joint, seam, or a pre-measured mark) with power cutting tool, cutting torch, hand shears, metal saw, and/or hammer & chisel.	knowledgeable in: <ul style="list-style-type: none"> - floor and/or rocker panel and body structure - methods of panel removal by the use of the prescribed tools and equipment 	power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch hand shears drill & bits for drilling out welds
5.06 Positions (aligns), fits and installs replacement floor and/or rocker panels by securing with clamps and/or tack welding, by welding and/or brazing	knowledgeable in: <ul style="list-style-type: none"> - floor and/or rocker panel and body structure - how to measure the applicable 	clamps electric welder oxy-acetylene welder rivetting tool drill & bits

Sub-tasks	Enabling Objectives	Tools & Equipment
<p>joints and seams, and where applicable, applies body solder (filler) and/or sealing materials to joints and seams. Tests for air and water leakage in applicable areas.</p>	<p>diagonals to facilitate correct alignment of the installation</p> <ul style="list-style-type: none"> - types and uses of weld joints skilled in oxy-acetylene welding and brazing 	<p>leading tools</p> <p>steel wool</p> <p>paddles</p> <p>body file</p> <p>disc grinder</p> <p>compressed air</p> <p>water hose</p>
<p>5.07 Straightens and aligns damaged areas of the panel using pushing & pulling equipment & applicable fixtures, bump hammering, and/or applying heat to severely bent areas to assist the straightening process.</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment & fixtures - methods of connecting attachments for pulling, pushing and holding - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas 	<p>portable unit-ized body straightener</p> <p>slide hammer</p> <p>metal puller & attachments</p> <p>push & pull ram or porto-power with fixtures, clamps and suction cup</p> <p>type metal pulling attaching fixture</p> <p>bumping hammer</p> <p>body hammers</p> <p>dollies</p> <p>spoons</p> <p>oxy-acetylene torch</p> <p>electric wire-feeds</p>
<p>5.08 Restores original shape to the damaged area of panel by working metal with various types of body metal hammers and dollies, welding or brazing patches, cracks and tears; applies heat to shrink stretched areas of the panel; grinds and files surface to insure proper shape of panel.</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - methods for working and reshaping sheet metal panels - oxy-acetylene welding and brazing - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander with the correct pressure and angle for restoring original shape to the metal 	<p>portable disc grinder & sander</p> <p>oxy-acetylene torch</p> <p>pick hammer</p> <p>dinging hammer</p> <p>square face hammer</p> <p>molding hammer</p> <p>wedge shaped hammer</p> <p>spoons (surfacing & others)</p> <p>low crown dollies</p> <p>high crown dollies</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
	<ul style="list-style-type: none"> - filing sheet metal panels with the correct pressure and angle for restoring original shape to the metal 	roughing dolly anvil dolly slapping file body file
5.09 Restores original shape to outer surface of the panel by applying hot or cold filler to dents, creases or low areas which are not accessible for straightening; files and sands panel to insure proper shape and condition of surface for painting.	skilled in: <ul style="list-style-type: none"> - methods of applying cold type fillers with a squeegee - methods for tinning dents in body metal with tinning compound & steel wool - applying & shaping hot body solder (lead) with oxy-acetylene torch and hardwood leading paddles - shaping plastic, epoxy & lead body fillers to conform with the original body shape by means of filing and sanding knowledgeable of types and uses of grinding disks and sandpaper	oxy-acetylene torch leading paddles steel wool plastic squeegee body file orbital sander disc sander hand sander plastic squeegee and other types of applicators
5.10 Replaces electrical wiring, carpets, sill cover (trim), seat assemblies, seat belts, and other interfering parts. (When repainting is applicable, the prescribed task is completed after repainting).	skilled in: <ul style="list-style-type: none"> - using the applicable methods and tools to install the aforementioned trim parts, electrical wiring, and seat assemblies - application of sound deadener material 	undercoating applicator mechanics tools

Performance Standard: to be completed by the user (see note on page xvi)

Task 6 Repairs or replaces centre pillars or door posts.

Activity Measure: (B2) - between 50% and 75% of the work force perform this task more than once a month (basic application of skill in the repair of auto and truck body sheet metal and support structures, with infrequent demand).

Trend: Trade continues with sheet metal repair (including body supporting structures) forming the major portion of the auto body trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
6.01 Analyses the direction and extent of collision damage and/or rust (corrosion) damage to determine if the pillar is restorable (repairable) to its original strength, shape and function or if a replacement is required.	knowledgeable in determining: <ul style="list-style-type: none"> - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage 	
6.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal	labour flat rate manual parts catalogue & price list body & frame manual
6.03 Makes pillar accessible for repair or removal by removing latch striker, inner trim, head lining, exterior moulding, seat belt retainer and other interfering parts and hardware.	skilled in using the applicable tools for removal of hardware, trim parts, and materials	trim removal tools applicable mechanics tools
6.04 Co-ordinates pillar repair or replacement with the related body, frame, and underbody repairs and alignments (notably the doors and sills).	knowledgeable in: <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods for co-ordinating pillar repair with other related repairs to the vehicle frame, unitized body and underbody or mechanical component 	frame, body, and mechanical manuals

Sub-tasks	Enabling Objectives	Tools & Equipment
6.05 Removes irreparable pillar by cutting metal and/or detaching spot welds at the replacement location (joint, seam, spot weld or a pre-measured mark).	knowledgeable in: <ul style="list-style-type: none"> - pillar and body structure - methods of pillar removal by the use of the prescribed tools and equipment 	power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch drill & bits for drilling out welds
6.06 Positions (aligns), fits, and installs replacement pillars by securing with clamps and/or tack welding; by welding and/or brazing joints and seams; and where applicable applies body solder (filler) and/or sealing materials to joints and seams; tests for air and water leakage.	knowledgeable in: <ul style="list-style-type: none"> - pillar and body structure - how to measure the applicable diagonals to facilitate correct alignment of the installation 	clamps electric welder oxy-acetylene welder water hose drill & bits leading tools steel wool paddles body file disc grinder & compressed air
6.07 Straightens and aligns damaged areas of the pillar using pushing & pulling equipment & applicable fixtures, bump hammering, and/or applying heat to severely bent areas to assist the	skilled in: <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment & fixtures - methods of connecting attachments for pulling, pushing & holding - methods of determining where to apply straightening forces - methods to prevent stretching of pillar metal 	portable unit-ized body straightener slide hammer metal puller & attachments push & pull ram or porto-power with fixtures clamps bumping hammers body hammers dollies spoons oxy-acetylene torch
6.08 Restores original shape to the damaged area of pillar by working metal with various types of body metal hammers and dollies, welding cracks and tears; applies heat to shrink stretched areas of the pillar; grinds and files surface to insure proper shade of pillar.	skilled in: <ul style="list-style-type: none"> - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of pillar - methods for working and reshaping pillars with applicable hammers 	portable disc grinder & sander applicable body hammers, spoons, dollies & files

Sub-tasks	Enabling Objectives	Tools & Equipment
	<ul style="list-style-type: none"> and dollies - oxy-acetylene welding - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander - filing metal with the correct pressure and angle for restoring original shape to the pillar 	
6.09 Restores original shape to outer surface of the pillar by applying hot or cold filler to dents, creases or low areas which are not accessible for straightening; files and sands pillar insure power shape and condition of surface for painting.	<p>skilled in:</p> <ul style="list-style-type: none"> - methods of applying cold type fillers with a squeegee - methods for tinning dents in body metal with tinning compound & steel wool - applying & shaping hot body solder (lead) with oxy-acetylene torch and hardwood leading paddles - shaping plastic, epoxy & lead body fillers to conform with the original body shape by means of filing and sanding 	<p>oxy-acetylene torch</p> <p>leading paddles</p> <p>steel wool</p> <p>plastic squeegee</p> <p>body file</p> <p>orbital sander & disc sander</p> <p>hand sander</p>
<p><u>NOTE:</u> The following task is completed after repainting, if repainting is applicable.</p>		
6.10 Replaces interior trim, exterior moulding, seat belt retainer, latch striker and other parts.	<p>skilled in using applicable methods & tools to install the aforementioned trim parts and seat belt retainer</p>	<p>moulding & trim tools</p> <p>applicable mechanics tools</p>

Performance Standard: to be completed by the user (see note on page xvi)

Task 7 Repairs or replaces front fenders, wheel housings, other front end supports, panels or structures, hood, grill and bumper.

Activity Measure: (B3) - between 50% and 75% of the work force perform this task more than once a week (basic application of skill in the repair of auto and truck body sheet metal and support structures, with frequent demand).

Trend: Trade continues with sheet metal repair (including body supporting structures) forming the major portion of the auto body trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
7.01 Analyses direct and/or indirect collision damage and/or rust (corrosion) damage to the parts to determine if the components are restorable (repairable) to their original strength, shape and function or if replacement is required.	knowledgeable in determining: <ul style="list-style-type: none"> - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage - types and location of inner construction 	
7.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal	labour flat rate manual parts catalogue & price list body & frame manual
7.03 Makes front end sheet metal parts or assembly accessible for repair or removal, by removing bumper, hood, battery, grill, lighting assemblies, wiring, radiator, trim, and other interfering parts.	skilled in using the applicable tools for removal of materials, hardware, and trim parts, and in care and storage of trim and glass	trim removal tools applicable mechanics tools
7.04 Co-ordinates front sheet metal, supporting structures, and bumper repairs or replacement with the related body, frame, and underbody repairs and alignments.	knowledgeable in: <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods for co-ordinating front sheet metal repair 	frame, body, and mechanical manuals

Sut-tasks	Enabling Objectives	Tools & Equipment
	with other related repairs to the vehicle frame, unitized body, and underbody or mechanical component	
7.05 Removes irreparable front sheet metal assemblies and/or parts by unfastening bolts, screws, and other types of retainment hardware, by cutting metal at the replacement location (joint, seam, or a pre-measured mark).	knowledgeable in: <ul style="list-style-type: none"> - front sheet metal body structure - methods of sheet metal removal by the use of the pre-described tools and equipment 	power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch hand shears drill & bits for drilling out welds
7.06 Positions (aligns), fits, and installs replacement front wheel housings, fenders, and other support panels or structures, by securing with bolts, screws, clamps, and/or tack welding; welding or brazing joints and seams; and where applicable applies body solder and/or sealing material to joints and seams; tests for air and water leakage.	knowledgeable in: <ul style="list-style-type: none"> - front sheet metal and body structure - how to measure the applicable diagonals to facilitate correct alignment of the installation - following pre-described methods of securing and completing the installation of the sheet metal 	clamps electric welder oxy-acetylene welder drill & bits leading tools steel wool paddles body file disc grinder compressed air water hose
7.07 Straightens and aligns damaged areas of front sheet metal using pushing and pulling equipment and applicable fixture, bump hammering, and/or applying heat to severely bent areas to assist the straightening process.	skilled in: <ul style="list-style-type: none"> - operation of portable pulling and pushing equipment and fixtures - methods of connecting attachments for pulling, pushing, and holding - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal 	portable unitized body straightener slide hammer metal puller and attachments push and pull ram or portopower with fixtures, clamps, and suction cup type metal pulling attaching fixture bumping hammer body hammers dollies

Sub-tasks	Enabling Objectives	Tools & Equipment
	<ul style="list-style-type: none"> - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of front sheet metal 	spoons oxy-acetylene torch
7.08 Straightens and aligns damaged areas of hood by means of:	same as in 7.07	same as in 7.07
<ul style="list-style-type: none"> - using suitable dent pulling equipment and applicable holding methods, such as a jig or working on the hood hinged to the vehicle - bump hammering - applying heat to severely bent areas to assist the straightening process. 		
7.09 Restores original shape to the damaged areas of front sheet metal and hood by working metal with various types of body metal hammers and dollies; welding or brazing patches, cracks and tears; applies heat to shrink stretched areas of the sheet metal; grinds and files surface to insure proper shape of metal.	skilled in: <ul style="list-style-type: none"> - methods for working and reshaping front end sheet metal and hood with applicable hammers and dollies - oxy-acetylene welding and brazing - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander with the correct pressure and angle for restoring original shape to the metal - filing sheet metal with the correct pressure and angle for restoring original shape to the metal 	portable disc grinder and sander oxy-acetylene torch pick hammer dinging hammer square face hammer molding hammer wedge shaped hammer spoons (surfacing & others) low crown dollies high crown dollies roughing dolly anvil dolly slapping file body file

Sub-tasks	Enabling Objectives	Tools & Equipment
7.10 Restores original shape to sheet metal surface by applying hot or cold body filler to the dents, creases, or low areas which are not accessible for straightening; files an sands surface to insure the proper shape and condition for painting.	skilled in: <ul style="list-style-type: none"> - methods of applying cold type fillers with a squeegee - methods for tinning dents in body metal with tinning compound & steel wool applying & shaping hot body solder (lead) with oxy-acetylene torch and hardwood leading paddles - shaping plastic, epoxy and lead body fillers to conform with the original body shape by means of filing and sanding 	oxy-acetylene torch leading paddles steel wool plastic squeegee body file orbital sander disc sander hand sander
7.11 Installs and/or replaces battery, radiator, wiring, grill, lights, trim parts (after painting), and other removed parts.	skilled in using the applicable tools for the reassembly of the aforementioned parts and wiring	ratchet sockets wrenches pliers screw drivers
7.12 Installs and/or replaces hood hinges, latch, striker, guides, stops, and other support parts.	skilled in installing the aforementioned hood parts	applicable mechanics tools
7.13 Installs and aligns repaired or replacement hood; adjusts striker to latch (lock) engagement.	skilled in: <ul style="list-style-type: none"> - replacing and aligning hoods - adjusting striker and lock mechanisms 	ratchet sockets wrenches pliers screw drivers
7.14 Measures and tests energy (impact) absorbing bumper mountings and mechanisms, and replaces if damaged or defective.	skilled in: <ul style="list-style-type: none"> - measuring energy absorbing bumper mountings to specifications - testing condition of E.A. mountings by applying applicable pressure 	measuring tape porto-power unit pressure reading hydraulic jack

Sub-tasks	Enabling Objectives	Tools & Equipment
7.15 Aligns and installs bumper.	skilled in the installation and alignment of bumpers	socket set wrenches measuring tape
7.16 Adjusts headlight aim.	skilled in the method of adjusting headlight aim	headlight alignment tester

Performance Standard: to be completed by the user (see note on page xvi)

Task 8 Replaces front cowl assembly; including pillars, firewall, upper floor panel and instrument panel.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year (basic application of skill in the repair of auto and truck body sheet metal and support structures, with infrequent demand).

Trend: Trade continues with sheet metal repair (including body supporting structures) forming the major portion of the auto body trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
8.01 Analyses direct and/or indirect collision damage and/or rust (corrosion) damage to determine if the parts are restorable (repairable) to their original strength, shape, and function or if a replacement is required.	knowledgeable in determining: <ul style="list-style-type: none"> - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage - types and location of inner construction 	
8.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto and truck body sheet metal and supporting structures	labour flat rate manual parts catalogue and price list body and frame manual

Sub-tasks	Enabling Objectives	Tools & Equipment
8.03 Makes cowl assembly and related parts accessible for repair or removal by removing front end sheet metal assemblies, front doors, windshield glass and wiper mechanisms, floor mat, firewall insulation, kick panels, wiring, and other interfering parts and hardware.	knowledgeable in the methods for disassembly of the aforementioned parts and assemblies. Skilled in the use of applicable tools for disassembly of the aforementioned parts and assemblies	trim removal tools power metal cutting tool oxy-acetylene cutting torch applicable mechanics tools
8.04 Co-ordinates sheet metal repair and/or replacement with the related body, frame, and underbody repairs and alignments.	knowledgeable in: - various types of vehicle structures and assemblies - methods for co-ordinating body repair with other related repairs to the vehicle frame, unitized body and underbody or mechanical component	body, frame, and mechanical manuals
8.05 Removes irreparable cowl assembly or parts by unfastening bolts, screws, and other types of retainment hardware; by cutting metal and/or detaching spot welds at the replacement location (joint, seam, spot weld or a pre-measured mark)	knowledgeable in: - cowl assembly and body structure - methods of cowl assembly removal by the use of applicable tools and equipment	power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch hand shears drill and bits for drilling out welds
8.06 Positions (aligns), fits and installs replacement cowl assembly, pillars (doorpost), firewall, upper floor panel, instrument panel, and other support parts, by means of securing with clamps, tack or spot welding; welding or brazing joints and seams; and where applicable applies body solder and/or sealing material to joints and seams; tests for air and water leakage.	knowledgeable in: - cowl assembly and body structure - how to measure the applicable diagonals to facilitate correct alignment of the installation - following pre-described methods of securing and completing the installation of the cowl assembly	clamps electric welder oxy-acetylene welder drill & bits leading tools steel wool paddles body file disc grinder compressed air water hose

Sub-tasks	Enabling Objectives	Tools & Equipment
<p>8.07 Straightens and aligns damaged areas of cowl assembly, pillars, firewall, upper floor pane, instrument panel, and other support parts, by using pushing & pulling equipment & applicable fixtures, bump hammering, and/or applying heat to severely bent areas to assist the straightening process.</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment & fixtures - methods of connecting attachments for pulling, pushing and holding - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of cowl assembly 	<p>portable unit-ized body straightener slide hammer metal puller & attachments push & pull ram or porto-power with fixtures bumping hammer body hammers dollies spoons oxy-acetylene torch</p>
<p>8.08 Restores original shape to the damaged areas of sheet metal by working metal with various types of body metal hammers and dollies; welding or brazing patches, cracks, and tears; applies heat to shrink stretched areas of the sheet metal; grinds and files surfaces to insure proper shape of cowl assembly components.</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - methods for working and re-shaping sheet metal with applicable hammers & dollies - oxy-acetylene welding & brazing - applying heat to shrink metal with an oxy-acetylene torch. - operating a disc grinder or sander with the correct pressure and angle for restoring original shape to the metal - filing sheet metal with the correct pressure and angle for restoring original shape to the cowl assembly components 	<p>portable disc grinder & sander oxy-acetylene torch pick hammer dinging hammer square face hammer molding hammer wedge shaped hammer spoons (surfacing & others) low crown dollies high crown dollies roughing dolly anvil dolly slapping file body file</p>
<p>8.09 Installs padded or plastic dash panels.</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - method of installing and securing 	<p>clamps sockets wrenches</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
	dash panels - adhesives used in securing dash panels	adhesive appli- cators vinyl cleaners

Performance Standard: to be completed by the user (see note on page xvi)

Task 9 Repairs or replaces roof panel.

Activity Measure: (C1) - between 25% and 50% of the work force perform this task more than once a year (basic application of skill in the repair of auto and truck body sheet metal and support structures, with infrequent demand).

Trend: Trade continues with sheet metal repair (including body supporting structures) forming the major portion of the auto body trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
9.01 Analyses direct and/or indirect collision damage to roof panel and/or rust (corrosion) damage to determine if the roof panel and supporting structure is restorable (repairable) to the original strength, shape and function, or if a replacement is required.	knowledgeable in determining: - direction of the damaging force - location of direct and indirect damage - location of ridges and channels - effects of rust (corrosion) damage	
9.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal	labour flat rate manual parts catalogue & price list body & frame manual.
9.03 Makes roof panel accessible for repair or removal by removing windshield, window glasses, head lining, trim, wiring, hardware, and other obstructing (interfering) parts.	skilled in using the applicable tools for removal of materials, hardware, and trim parts and in safe handling and storage of glass and trim	trim removal tools applicable mechanics tool

Sub-tasks	Enabling Objectives	Tools & Equipment
9.04 Co-ordinates the repair or replacement of the roof panel with the related body, frame, and underbody repairs and alignments.	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods for co-ordinating roof panel repair with other related repairs to the vehicle frame, unitized body, and underbody or mechanical component 	body, frame, and mechanical manuals
9.05 Removes irreparable roof panel by cutting at the replacement location (joint, seam, or a premeasured mark).	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - roof panel and body structure - methods of roof panel removal by the use of the applicable tools - types and location of wire harness 	<p>power metal cutting tool (air chisel)</p> <p>hack saw</p> <p>hammer & chisel</p> <p>oxy-acetylene cutting torch</p> <p>hand shears</p> <p>drill & bits for drilling out welds</p>
9.06 Positions (aligns), fits, and installs replacement roof panel by securing with clamps, and/or tack welding (spot welding); welding or brazing joints and seams; and where applicable applies body solder and/or sealing material to joints and seams; tests for air and water leakage.	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - roof panel and body structure - how to measure the applicable diagonals to facilitate correct alignment of the installation - following pre-described methods of securing and completing the installation of the roof panel - types of body sealers 	<p>clamps</p> <p>electric welder</p> <p>oxy-acetylene welder</p> <p>drill & bits</p> <p>leading tools</p> <p>steel wool</p> <p>paddles</p> <p>body file</p> <p>disc grinder</p> <p>compressed air</p> <p>water hose</p>
9.07 Straightens and aligns damaged areas of the roof panel, support parts, and openings by using pushing & pulling equipment &	<p>skilled in:</p> <ul style="list-style-type: none"> - operation of portable pulling & pushing equipment and fixtures 	<p>portable unitized body straightener</p> <p>slide hammer</p> <p>metal puller &</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
applicable fixtures, bump hammering, and/or applying heat to severely bent areas to assist the straightening process.	<ul style="list-style-type: none"> - methods of connecting attachments for pulling, pushing, and holding - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of roofpanel 	attachments push & pull ram or porto-power with fixtures, clamps, and suction cup type metal pulling attaching fixture bumping hammers body hammers dollies spoons oxy-acetylene torch
9.08 Restores original shape to the roof panel by working metal with various types of body metal hammers and dollies; welding or brazing cracks, and tears; applies heat to shrink stretched areas of the roof panel; grinds and files surface to insure proper shape of panel.	skilled in: <ul style="list-style-type: none"> - methods for working and re-shaping roof panel with applicable hammers and dollies - oxy-acetylene welding and brazing - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander - filing sheet metal with the correct pressure and angle for restoring original shape to the roof panel 	portable disc grinder & sander oxy-acetylene torch pick hammer dinging hammer square face hammer molding hammer wedge shaped hammer spoons (surfacing & others) low crown dollies high crown dollies roughing dolly anvil dolly slapping file body file
9.09 Restores original surface condition to roof panel by applying hot or cold body filler to the dents, creases, or low areas	skilled in: <ul style="list-style-type: none"> - methods of applying cold type fillers with a squeegee 	oxy-acetylene torch leading paddles steel wool plastic squeegee

Sub-tasks	Enabling Objectives	Tools & Equipment
which are not accessible for straightening; files and sands surface to insure the proper shape and condition for painting (refinishing).	<ul style="list-style-type: none"> - methods for tinning dents in body metal with tinning compound & steel wool - applying & shaping hot body solder (lead) with oxy-acetylene torch and hardwood leading paddles - shaping plastic, epoxy & lead body fillers to conform with the original body shape by means of filing and sanding - knowledge and types of grinding discs and sand-paper 	body file orbital sander disc sander hand sander

Performance Standard: to be completed by the user (see note on page xvi)

Task 10 Repairs or replaces door assembly or outer door panel.

Activity Measure: (B3) - between 50% and 75% of the work force perform this task more than once a week (basic application of skill in the repair of auto and truck body sheet metal and support structures, with frequent demand).

Trend: Trade continues with sheet metal repair (including body supporting structures) forming the major portion of the auto body trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
10.01 Analyses direct and/or indirect collision damage to doors and/or rust (corrosion) damage to determine if the parts are restorable (repairable) to their original strength,	knowledgeable in determining: <ul style="list-style-type: none"> - direction of the damaging force - location of direct and indirect damage 	

Sub-tasks	Enabling Objectives	Tools & Equipment
shape, and function, or if replacement is required.	<ul style="list-style-type: none"> - location of ridges and channels - effects of rust (corrosion) damage - effects of damage to inner construction and hardware 	
10.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman auto body mechanic in the repair or replacement of auto & truck body sheet metal	labour flat rate manual parts catalogue & price list body & frame manual
10.03 Makes door panel or assembly accessible for repair or replacement by removing handles, interior trim panel, outer mouldings & fixtures, remote control, lock, regulator, power lift mechanism, windows, channels, weatherseals, hinges, door check link, and other interfering parts and hardware; removes door from vehicle if required.	skilled in the use of applicable tools for removal of materials, hardware, and trim parts	trim removal tools applicable mechanics tools
10.04 Co-ordinates the repair or replacement of door with the related body, frame, and underbody repairs and alignments.	<p>knowledgeable in:</p> <ul style="list-style-type: none"> - various types of vehicle structures and assemblies - methods for co-ordinating door related repairs to the vehicle frame, unitized body, and underbody or mechanical component 	body, frame, and mechanical manuals measuring tape
10.05 Straightens door frame and outer door panel to restore original shape and alignment by means of:	<p>skilled in:</p> <ul style="list-style-type: none"> - operation of power door straightening equipment 	portable unitized body straightener door stretcher

Sub-tasks	Enabling Objectives	Tools & Equipment
<ul style="list-style-type: none"> - using a suitable holding method, such as a holding jig, or working on the door hinged to the vehicle - using a door stretcher and/or hydraulic or air spreading unit - bump hammering and/or applying heat to severely bent areas to assist the straightening process. 	<ul style="list-style-type: none"> - methods of placing and securing power straightening equipment - methods of determining where to apply straightening forces - methods to prevent stretching of panel metal - applying controlled heat with an oxy-acetylene torch in straightening severely bent areas of panel 	<ul style="list-style-type: none"> holding jig slide hammer metal puller & attachments push & pull ram or porto-power with fixtures, clamps, and suction cup type metal pulling attaching fixture applicable hammers, dollies, & spoons oxy-acetylene torch
<p>10.06 Restores original shape to the damaged area of outer door panel by working metal with various types of body metal hammers and dollies; welding or brazing cracks and tears. Applying heat to shrink stretched areas of the panel; grinds and files surface to insure proper shape of panel.</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - methods for working and re-shaping sheet metal panels with applicable hammers and dollies - oxy-acetylene welding and brazing - applying heat to shrink metal with an oxy-acetylene torch - operating a disc grinder or sander - filing sheet metal panels with the correct pressure and angle for restoring original shape to the metal 	<ul style="list-style-type: none"> portable disc grinder & sander oxy-acetylene torch pick hammer dinging hammer square face hammer molding hammer wedge shaped hammer spoons (surfacing & others) low crown dollies high crown dollies roughing dolly anvil dolly slapping file body file
<p>10.07 Restores original shape to outer surface of the panel by applying hot or cold filler to dents, creases or low areas which are not</p>	<p>skilled in:</p> <ul style="list-style-type: none"> - methods of applying cold type fillers with a squeegee 	<ul style="list-style-type: none"> oxy-acetylene torch leading paddles steel wool plastic squeegee

Sub-tasks	Enabling Objectives	Tools & Equipment
accessible for straightening; files and sands panel to insure proper shape and condition of surface for painting	<ul style="list-style-type: none"> - methods for tinning dents in body metal with tinning compound & steel wool - applying & shaping hot body solder (lead) with oxy-acetylene torch and hardwood leading paddles - shaping plastic, epoxy & lead body fillers to conform with the original body shape by means of filing and sanding 	body file orbital sander disc sander hand sander
10.08 Removes irreparable outer panel (skin) of door from the door frame (shell) by cutting metal and/or detaching spot welds at the replacement location (joint, seam, or spotweld).	knowledgeable in: <ul style="list-style-type: none"> - outer door panel and body structure - methods of panel removal by the use of the predescribed tools and equipment - oxy-acetylene welding and brazing - types of weld joints 	power metal cutting tool (air chisel) hack saw hammer & chisel oxy-acetylene cutting torch hand shears drill & bits for drilling out welds disc sander
10.09 Positions (aligns), fits, and installs replacement outer panel to door frame by means of securing with clamps, tack or spot welding; welding or brazing joints and seams; and where applicable applies body solder and/or sealing material to joints and seams; applies sound deadener to panel.	knowledgeable in: <ul style="list-style-type: none"> - outer door panel and body structure - how to measure the applicable diagonals to facilitate correct alignment of the installation - following pre-described methods of securing and completing the installation of the panel - oxy-acetylene welding and brazing - types of sealers 	clamps electric welder oxy-acetylene welder drill & bits leading tools steel wool paddles body file disc grinder undercoating applicator

10.10	Replaces door hinges, windows & channels, regulator, power lift, remote control, outer handle, mouldings, weatherseals (water dam), interior trim panel & handles, and other parts and hardware.	skilled in using applicable methods and tools for installing aligning, and adjusting the aforementioned parts	moulding tools trim tools weather seal tools weather sealer applicator screw drivers small socket & wrench set pliers
10.11	Installs and aligns repaired or replacement door; adjusts and secures hinges and door check link; aligns and adjusts striker to latch (lock) engagement; reconnects power windows; fits weather seals; tests for dust or water leaks and/or wind noise.	same as in 10.10	same as in 10.10 with the addition of: compressed air water hose

Performance Standard: to be completed by the user (see note on page xvi)

BLOCK C WINDOWS AND WINDSHIELD

Task 11 Removes and replaces door and/or vent windows and their operating and support parts (including channels)

Activity Measure: (D4) - less than 25% of the work force perform this task more than once a day (application of skill in replacing door windows and mechanisms, with infrequent demand).

Trend: The replacement (repair) of door windows and mechanisms continues to make up a small portion of trade in auto body shop, but it appears that a similar level of activity is performed by the mechanical repair shops.

	<u>Sub-tasks</u>	<u>Enabling Objectives</u>	<u>Tools & Equipment</u>
11.01	Makes windows and their mechanisms accessible for inspection and repair by removing inside door handles, arm rest, door	skilled in using the applicable methods and tools for removal of the aforementioned parts	screw drivers special tools for removal of door-handles & window

	Sub-tasks	Enabling Objectives	Tools & Equipment
	trim panel, panel water seal (dam). and all other obstructing parts.		winders putty knife hexagon wrench set
11.02	Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in the replacement of door and vent windows and their operating and support parts	labour flat rate manual parts catalogue & price list applicable repair manual
11.03	Removes faulty or damaged window regulator, power window mechanism, door and/or vent windows, door window channels, vent window frame assembly (divider channel), and window weatherseals.	skilled in using the applicable tools for disassembly and removal of the aforementioned door parts	ratchet & sockets small wrench set screw drivers pliers
11.04	Inspects and checks all operational and support parts for wear, corrosion and breakage; determines which parts require replacement.	knowledgeable in: - function of door and/or vent window operating mechanisms; methods of determining condition of mechanism or diagnosing failure (fault) - retainment and purpose of door and/or vent window supporting parts. - uses and types of lubricants for various parts skilled in applying the applicable methods and tools to determine condition or fault in door and/or vent window or support mechanisms	applicable hand tools
11.05 (a)	Removes damaged door and/or vent window from the rubber inset channels or regulator attachment;	skilled in using the applicable method and tools for disassembly and reassembly of	applicable mechanics tools putty knife knife

Sub-tasks	Enabling Objectives	Tools & Equipment
cleans, prepares, and installs new rubber inset into channel or regulator attachment.	window inset channels and regulator attachment	
11.05 (b) Installs replacement door glass into rubber inset in channel or regulator attachment.		
11.06 (a) Removes damaged vent glass from rubber inset in vent glass frame or hinged attachment; cleans, prepares and installs new rubber into vent glass frame or installs applicable hinge attachment insulator bushing.	same as in 11.05	same as in 11.05
11.06 (b) Installs replacement vent glass into rubber inset in attachment.		
11.07 Cleans and/or lubricates reuseable operating and support parts.	skilled in cleaning the various types of parts with applicable cleaning solvent and/or compressed air knowledgeable in: <ul style="list-style-type: none"> - lubrication locations in window operating mechanisms - applicable type of lubrication and its application 	parts cleaning brush solvent application container compressed air
11.08 Installs vent window and/or frame assembly and aligns frame; replaces weatherseal if applicable.	skilled in using the applicable methods and tools for installing and aligning the aforementioned assembly	ratchet & sockets small wrench set screw drivers pliers weatherseal tools sealing material applicator

Sub-tasks	Enabling Objectives	Tools & Equipment
11.09 Installs door window run channels and window into door; aligns channels; replaces weatherseal if applicable.	same as in 11.08	same as in 11.08
11.10 Installs regulator, power window mechanism; adjusts travel and window stops.	skilled in using the applicable methods and tools for installing and adjusting the aforementioned assemblies knowledgeable in safe handling of electrically operated regulators	ratchet & sockets small wrench set screw drivers pliers weatherseal tools sealing material applicator
11.11 Checks windows for water leakage and wind noise; adjusts channels; fits weatherseals.	skilled in: - methods for checking cause of wind noise and/or water leaks with the applicable tools - methods for correcting wind noise and/or water leaks with the applicable tools	weatherseal tools sealing material applicator compressed air water hose trim tools small wrench set screw drivers
11.12 Replaces door lock mechanism, inside panel water seal (dam), inside door trim panel, arm rest, handles, and other hardware.	skilled in using the applicable methods and tools for installing and adjusting the aforementioned parts	sealing material applicator screw drivers small wrench set trim tools

Performance Standard: to be completed by the user (see note on page xvi)

Task 12 Removes and replaces windshield, rear window and stationary side windows which have rubber channel type installation; reseals window glass and rubber.

Activity Measure: (D2) - less than 25% of the work force perform this task more than once a month - (specialized skill in the replacement of stationary window glass, with infrequent demand).

Trend: Stationary window glass (windshield) replacement is being done almost exclusively by the glass trade shops and their mobile service units. (D2) is applicable only to the small number of auto body shops which perform this specialized replacement service.

Sub-tasks	Enabling Objectives	Tools & Equipment
12.01 Estimates time and cost for replacing windows and repairing water leaks.	skill and experience of a proficient journeyman auto body mechanic in the replacement of stationary window glass (windshield & others) and repair of window water leaks in auto and truck bodies with rubber type window installation	labour flat rate manual parts catalogue & price list body & glass manual
12.02 Makes windows accessible for removal by means of: <ul style="list-style-type: none"> - removing inner garnish mouldings and, when applicable, outer reveal mouldings - removing windshield wiper arm & blade assemblies, inside rearview mirror, sun visors; disconnecting windshield type radio antenna, and other interfering accessories - applying protection to prevent damage to seats, instrument panel, cowl, engine hood and/or trunk lid. 	skilled in using the applicable methods and tools for removal of the aforementioned parts	wiper arm tool screw drivers wrenches moulding tools pliers vinyl protection covers

Sub-tasks	Enabling Objectives	Tools & Equipment
12.03 Determines if window glass breakage was caused by road hazard or collision, tension within the installation, or metal or screw contact within the installation.	knowledgeable in methods of determining the aforementioned causes of window glass breakage skilled in: <ul style="list-style-type: none"> - the visual checking of glass and window openings - checking measurements of window openings & diagonals with a measuring tape - checking glass-alignment to opening using new glass 	measuring tape body manual
12.04 Removes window by loosening the rubber window channel with the wedge tool, and by applying physical pressure to the inside of the window; *removes reveal moulding from rubber; removes rubber channel from glass and determines if it is reuseable. If rubber is reuseable it is cleaned and prepared for reuse. (*for types of reveal moulding that have to be removed <u>after</u> the window has been removed).	skilled in using the applicable methods and tools for removal of the aforementioned parts	moulding tools channel loosening tools rubber mallet screw drivers wedge tool
12.05 Prepares window opening and flange for replacement of window by cleaning, removing burs, and, if necessary, straightening flange; applies sealing compound to applicable area of window ledge (flange).	knowledgeable in methods of measuring and straightening window opening flange. skilled in: <ul style="list-style-type: none"> - cleaning the aforementioned parts - applying sealing compound to window opening ledge (flange) 	cleaning brush cleaning solvent container flange straightening tools measuring tape body manual

Sub-tasks	Enabling Objectives	Tools & Equipment
12.06 Installs, fits and secures rubber channel onto window glass; if applicable, installs reveal moulding into moulding retainment groove in the rubber window channel; places window installation cord into the installation groove (flange) in the rubber window channel.	skilled in using the applicable methods and tools for installation of the aforementioned parts	channel tools moulding tools putty knife screw drivers window installation cord silicone-lubricant
12.07 Installs window & rubber into window retainment flange in vehicle window opening by using cords and by applying pressure to the window; seals rubber to glass by using applicable sealing compound; if applicable, reconnects windshield type radio antenna.	same as in 12.06	window installation cord channel installation tools windshield sealer applicator
12.08 Tests for water leaks; replaces mouldings, windshield wiper arm & blade assemblies, sun visors, mirror, and other removed parts; cleans glass.	knowledgeable in methods of making water leak tests. Skilled in using the applicable methods and tools for intallation, adjustment and replacement of the aforementioned parts	screw drivers wiper arm tool or wrench moulding tools water hose window cleaner applicator

Performance Standard: to be completed by the user (see note on page xvi)

Task 13 Removes and replaces windshield, rear window and stationary side windows which have butyl tape type installation; reseals window glass.

Activity Measure: (D2) - less than 25% of the work force perform this task more than once a month - (specialized skill in the replacement of stationary window glass, with infrequent demand).

Trend: Stationary window glass (windshield) replacement is being done almost exclusively by the glass trade shops and their mobile service units. (D2) is applicable only to the small number of auto body shops which perform this specialized replacement service.

Sub-tasks	Enabling Objectives	Tools & Equipment
13.01 Estimates time and cost for replacing windows and repairing water leaks.	skill and experience of a proficient journeyman auto body mechanic in the replacement of stationary window glass (windshield & others) and repair of window water leaks in auto and truck bodies with butyl tape type window installation	labour flat rate manual parts catalogue & price list body & glass manual
13.02 Makes windows accessible for removal by means of: <ul style="list-style-type: none"> - removing inner garnish mouldings and, when applicable, outer reveal mouldings - removes windshield wiper arm & blade assemblies, inside rearview mirror, sun visors; disconnects windshield type radio antenna, and other interfering accessories - applies protection to prevent damage to seats, instrument panel, cowl, engine hood and/or trunk lid. 	skilled in using the applicable methods and tools for removal of the aforementioned parts	wiper arm tool screw drivers wrenches moulding tools pliers vinyl protection covers
13.03 Determines if window glass breakage was caused by road hazard or collision, tension within the installation, or metal or screw contact within the installation.	skilled in: <ul style="list-style-type: none"> - the visual checking of glass and window openings - checking measurements of window openings & diagonals with a measuring tape 	measuring tape body manual

Sub-tasks	Enabling Objectives	Tools & Equipment
13.04 Removes window by softening butyl tape with applicable chemical or an electric heating tool and applying physical pressure to the inside of window to stretch the tape so as to allow room to cut or break adhesion.	skilled in using the applicable methods and tools for removal of the aforementioned parts	butyl tape cutting tool (wire with handles or electric heat) solvent applicator rubber mallet
13.05 Prepares window opening and flange for replacement of window by cleaning away remains of butyl tape; straightening flange and removing burs; priming flange and installing new butyl tape.	skilled in: <ul style="list-style-type: none"> - cleaning the aforementioned parts - applying butyl primer to window opening ledge (flange) - using the applicable methods for measuring and straightening window opening flange 	butyl primer applicator cleaning brush flange straightening tools measuring tape body manual
13.06 Prepares window glass for installation by applying masking tape markers to glass and window opening to insure proper window position and alignment.	knowledgeable in the method of correct alignment of replacement window glass	measuring tape
13.07 Installs window by locating in pre-marked position in window opening and applying hand pressure to window so as to contact and adhere to butyl tape.	skilled in applying method for the aforementioned installation	
13.08 When applicable, applies liquid butyl sealer to opening where the window has not contacted and adhered to the butyl tape.	skilled in the method of applying liquid butyl sealer	butyl sealing material applicator
13.09 Tests for water leaks; replaces mouldings, windshield wiper arm & blade assemblies, inside mirror, sun visors and other removed parts; cleans glass.	knowledgeable in methods of: <ul style="list-style-type: none"> - replacing the aforementioned parts - making water leak tests 	screw drivers wiper arm tool or wrench moulding tools water hose window cleaner applicator

Sub-tasks	Enabling Objectives	Tools & Equipment
	skilled in using the applicable methods and tools for installation and adjustment of the aforementioned parts	

Performance Standard: to be completed by the user (see note on page xvi)

BLOCK D LOCKS, HANDLES, HINGES, ELECTRIC WIRING HARNESS, SEAT FRAME AND SPRING ASSEMBLY

Task 14 Removes, repairs, lubricates, and replaces key operated cylinder lock and connecting mechanisms.

Activity Measure: (D2) - less than 25% of the work force perform this task more than once a month - (specialized skill in the repair and replacement of key operated cylinder locks, with infrequent demand).

Trend: To replace rather than repair faulty cylinder locks due to the high labour cost of repair.

Sub-tasks	Enabling Objectives	Tools & Equipment
14.01 Diagnoses failure (mal-function) in the lock and/or connecting mechanism and determines the repair that is required.	knowledgeable in both function and methods of repair and/or replacement of the lock cylinder and connecting mechanism	
14.02 Estimates time and cost of repair	skill and experience of a proficient journeyman mechanic in the repair and replacement of lock cylinder and connecting mechanism	labour flat rate manual parts catalogue & price list applicable repair manual

Sub-tasks	Enabling Objectives	Tools & Equipment
14.03 Removes lock assembly and connecting mechanisms from door, tailgate, trunk lid, fuel filler cover, or glove compartment by removing applicable parts, such as handles, trim panel, access panel, all other interfering hardware, or changing position of window.	skilled in using the applicable methods and tools for removal of the aforementioned parts	trim tools pliers screw drivers special tools for lock removal
14.04 When possible has the lock cylinder repaired by a locksmith, if this is not applicable, procures a new lock cylinder assembly.	knowledgeable in both function and methods of repair and/or replacement of the lock cylinder and connecting mechanism.	
14.05 Inspects and insures that the replacement lock tumblers & cylinder have been lubricated with graphite and that the key operates the lock cylinder; lubricates if required.	Skilled in using the applicable method for lubricating the cylinder lock	graphite lubricant applicator
14.06 Installs repaired or replacement cylinder lock mechanism in door, trunk lid, tailgate, fuel filler cover, or glove compartment, by engaging, reconnecting, and lubricating the operating mechanism; installs lock retainment hardware; replaces removed parts.	skilled in using the applicable methods and tools for replacement of the aforementioned parts	trim tools pliers screw drivers special tools for lock installation

Performance Standard: to be completed by the user (see note on page xvi)

Task 15 Removes, repairs, lubricates, and replaces latch type locks, handles, remote control and other lock mechanisms.

Activity Measure: (D3) - less than 25% of the work force perform this task more than once a week - (basic skill in the repair and replacement of latch type locks and mechanisms, with infrequent demand).

Trend: To replace faulty locks rather than repair them due to the safety aspect and the fact that the labour cost for repairing is generally more than the cost of a new lock.

Sub-tasks	Enabling Objectives	Tools & Equipment
15.01 Examines damage or diagnoses malfunction in the lock and/or lock mechanisms and determines the repair and action required to correct failure.	knowledgeable in both function and methods of repair and/or replacement of latch type locks and mechanisms	
15.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in the repair and replacement of latch type locks and mechanisms	labour flat rate manual parts catalogue & price list applicable repair manual
15.03 Removes lock (latch), handles, remote control, and other mechanisms from doors, tailgate, trunk lid, hood, or glove compartment by: <ul style="list-style-type: none"> - removing the applicable interfering parts, such as, trim panel (plate), and all other hardware, or changing position of window - disconnecting lock control rods, cables, and other operating linkages - removing all retainment hardware such as cap screws & bolts. 	skilled in using the applicable methods and tools for removal of the aforementioned parts	trim tools special tools for removal of inside handle & winders screw drivers pliers small wrench & socket set
15.04 Checks, repairs, and lubricates lock and mechanism in preparation for installation by means of: <ul style="list-style-type: none"> - replacing broken spring - welding or brazing broken linkage 	skilled in using the applicable methods and tools for inspecting, repairing, and lubricating. Knowledgeable in the proper types of lubricants	electric welder oxy-acetylene torch lubricant applicator applicable mechanics tools

Sub-tasks	Enabling Objectives	Tools & Equipment
<ul style="list-style-type: none"> - cleaning and lubricating applicable operating parts - insuring that the replacement or repaired lock and/or mechanism is functional. 		
15.05 Installs repaired or replacement lock and/or mechanism in door, tail-gate trunk lid, hood, or glove compartment by: <ul style="list-style-type: none"> - engaging, connecting, and lubricating the operating mechanisms - installing and securing lock, lock mechanisms (including handle, if applicable), remote control, and all retainment hardware. 	skilled in using the applicable methods and tools for the replacement and lubrication of the aforementioned parts	lubricant applicator trim tools special tools for replacing inside handle & winders screw drivers pliers small wrench & socket set
15.06 Adjusts, aligns, and positions lock striker to insure that the engagement into the lock latch is without interference or looseness; where applicable, checks operation of hood safety lock.	skilled in using the applicable methods and tools for adjusting lock to striker engagement	applicable lock & striker adjustment tools

Performance Standard: to be completed by the user (see note on page xvi)

Task 16 Removes, replaces, and lubricates hinges for doors, trunk lid, tailgate, hood or glove compartment.

Activity Measure: (D2) - 25% or less, of the work force perform this task more than once a month - (basic skill in the repairing and replacing of hinges, with infrequent demand).

Trend: To replace damaged or worn (faulty) hinges, rather than repair or straighten them, due to the safety aspect and the fact that the labour cost for repairing is generally more than the cost of a new hinge.

Sub-tasks	Enabling Objectives	Tools & Equipment
16.01 Examines damage or diagnoses the failure in the hinges and determines the repair or replacement required to restore the original strength and function.	knowledgeable in both function and methods of repair and/or replacement of the aforementioned hinges	
16.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in the repair and replacement of hinges	repair manuals labour flat rate manual parts catalogue & price list applicable repair manual
16.03 Frees seized (rusted) hinge pin by applying heat and/or penetrating oil.	skilled in using the applicable methods and tools for freeing rusty (seized) hinges	oxy-acetylene torch lubricant applicator hammer
16.04 Removes hinges from doors, trunk lid, tailgate, hood, or glove compartment by: <ul style="list-style-type: none"> - removing the applicable interfering parts such as, access panel, sheet metal, weatherseal, check link, or other hardware - supporting door (or other) and detaching hinges by removing cap screws or bolts - removing torsion bars. 	skilled in using the applicable methods and tools for removal of the aforementioned parts knowledgeable and skilled in safe handling of torsion bars	supporting fixture for door (or others) small socket and wrench set screw drivers
16.05 Check and prepares replacement hinge or brass bushing by: <ul style="list-style-type: none"> - checking operation of the hinge & opening stop or check link - lubricating the hinge pin or bushing and opening stop or check link. 	skilled in the applicable methods for checking and lubricating hinges	lubricant applicator

Sub-tasks	Enabling Objectives	Tools & Equipment
16.06 Installs replacement hinges onto vehicle, then onto door, tailgate, trunk lid, hood, or glove compartment by: <ul style="list-style-type: none"> - installing the hinge cap screws, or bolts, and aligning position of hinge for correct alignment and function of the assembly in the vehicle opening - checking alignment of lock (latch) striker and adjusting its position if out of line, to insure proper engagement into latch - connecting stop link mechanism, if applicable - replacing all parts that were removed to facilitate the repair of replacement - adjusting trunk lid springs, if applicable. 	skilled in using the applicable method and tools for replacement, alignment, and adjustment of the aforementioned parts	supporting fixture for door (or others) small socket & wrench set screw drivers applicable lock & striker adjustment tools weather sealing material applicator

Performance Standard: to be completed by the user (see note on page xvi)

Task 17 Repairs or replaces electric wiring harness; replaces damaged lighting assemblies, switches or battery.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year - (specialized skill in the repair and replacement of auto and truck wiring and/or electrical systems, with infrequent demand).

Trend: To sub-let electrical harness replacement to the auto electric service shops. The auto body mechanic generally performs only minor repairs to wiring or wiring harness, such as rejoining, splicing, and insulating wires. (D1) activity measure represents that of the auto body mechanics only.

Sub-tasks	Enabling Objectives	Tools & Equipment
17.01 Examines damage to wiring harness, lighting assembly, switch, or battery to determine the repair or replacement that is required to restore the electrical function.	knowledgeable in both function and methods of testing, repairing and/or replacing the aforementioned electrical parts	
17.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in the diagnoses, repair, and replacement of wiring harness, lighting assemblies, switches, and battery	labour flat rate manual parts catalogue & price list applicable repair manual
17.03 Restores the electrical functions to wire harness by: <ul style="list-style-type: none"> - checking and testing the faulty circuits to determine location of grounded or broken wire (when not visibly damaged) by using a suitable continuity tester or voltage meter - selecting the correct wire for rejoining (or repairing) by using a wiring diagram and colour code and/or a continuity tester - splicing and joining damaged and/or broken wires with a resistance free connection, such as soldering a twisted wire join or installing a solderless joiner - insuring that the operation of repaired circuit has been restored - reinsulating wires and repaired harness - replacing irreparable wiring harness (burnt or shredded) 	skilled in using the applicable methods and tools for testing, repairing, or replacing the aforementioned parts knowledgeable in diagnosing electrical problems and circuits. (Note the comments under <u>Trend</u> for Task 18)	small wrench & socket set continuity tester ohm meter voltage meter wire stripping & joint crimping tool electric soldering tool screw drivers

Sub-tasks	Enabling Objectives	Tools & Equipment
<ul style="list-style-type: none"> - removing and replacing damaged or faulty light fixtures (assemblies) and switches - removing and replacing damaged battery and/or cables. 		

Performance Standard: to be completed by the user (see note on page xvi)

Task 18 Removes, repairs and/or replaces damaged fully supporting type seat frames.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year - (specialized skill in the repair and replacement of seat frames and upholstery, with infrequent demand).

Trend: To replace broken or bent seat frames with a new frame or a complete used seat assembly, rather than repair, due to the safety aspect and also the labour cost for repairing is generally more than the cost of a new frame or complete used seat assembly. A large percentage of seat structure and upholstery repair is being sub-let to the specialized auto upholstery and seat repair shops. (D1) activity level is applicable to the very small percentage of auto body shops that perform seat repairs.

Sub-tasks	Enabling Objectives	Tools & Equipment
18.01 Examines the failure or damage in the seat frame and determines the repair and/or replacement action that is required to restore the original strength, shape, and function.	knowledgeable in both function and methods of repair and/or replacement of seat frames	
18.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in repairing and replacing seat frames and upholstery	labour flat rate manual parts catalogue & price list applicable repair manual

Sub-tasks	Enabling Objectives	Tools & Equipment
<p>18.03 Repairs broken or bent seat frame in the installed position if feasible, or if not, in a removed position by:</p> <ul style="list-style-type: none"> - detaching seat frame securement and removing seat and frame assembly from vehicle - detaching and removing upholstery and inflammable padding from the area of frame requiring repair - applying insulation to area that may be damaged when welding or heating the frame - applying controlled heat and pressure to straighten bent frame to original shape and dimensions - welding broken frame - repainting the repaired area of the seat frame. 	<p>skilled in</p> <ul style="list-style-type: none"> - applicable methods and tools for removal and replacement of seat frames and upholstery - repairing bent or broken seat frames by means of applying controlled heat with an oxy-acetylene torch, for straightening frame, and/or by welding cracked or broken frame by use of applicable type welder 	<p>wrench & socket set</p> <p>screw drivers</p> <p>pliers</p> <p>upholstery holding vise-grip pliers</p> <p>electric welder</p> <p>oxy-acetylene torch</p> <p>hog ring tools</p> <p>applicable repair manual</p> <p>hex wrench set</p>
<p>18.04 Removes irreparable seat frame by removing applicable upholstery and/or seat structures and mechanisms.</p>	<p>skilled in applicable methods and tools for removal and replacement of seat frames and upholstery.</p> <p>Knowledgeable in types of seat-track mechanism</p>	<p>wrench & socket set</p> <p>hex wrench set</p> <p>screw drivers</p> <p>hog ring tools</p> <p>pliers</p> <p>upholstery holding vise-grip pliers</p> <p>applicable repair manual</p>
<p>18.05 Replaces seat upholstery to the repaired area (or replacement frame, if applicable) by:</p> <ul style="list-style-type: none"> - reinstalling the padding and all supporting parts and materials - positioning and refitting upholstery to conform with the seat structure (spring and frame assembly) and installing hog rings and other forms of retainment hardware 	<p>skilled in</p> <ul style="list-style-type: none"> - applicable methods and tools for fitting and installing upholstery to seat frames - cleaning seat upholstery with applicable cleaning solution. <p>Knowledgeable in types of seat belt warning devices built into seats</p>	<p>same as in 18.03 with the addition of:</p> <p>upholstery</p> <p>cleaning material applicator</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
18.05 - replacing side panels and Cont. other trim and hardware - cleaning upholstery (if applicable at this time).		
18.06 Installs reassembled seat frame and seating structure into vehicle; cleans upholstery.	skilled in using the applicable methods and tools for: - reinstalling the aforementioned seating structures into vehicle - lubricating seat mechanism (when applicable) - insuring proper engagement and operation of seat mechanism. Knowledgeable in usage of fabric cleaners	wrench & socket set hex wrench set screw drivers pliers applicable cleaners

Performance Standard: to be completed by the user (see note on page xvi)

Task 19 Removes and replaces faulty or damaged seat hinge, seat back lock, recliner mechanism, seat adjuster assembly, mounting channel or track, head rest frame and post and installation casing.

Activity Measure: (D1) - 25% or less of the work force perform this task more than one a year (specialized skill in repair and replacement of seat mechanisms and hardware, with infrequent demand).

Trend: To replace damaged or faulty parts rather than repair, notably due to the safety aspect, and also to enable a more satisfactory repair.

Sub-tasks	Enabling Objectives	Tools & Equipment
19.01 Examines and/or diagnoses damaged or faulty seat mechanisms and hardware, and determines the repair and/ or replacement action required.	knowledgeable in both function and methods of repair and/or replacement of seat mechanisms	

	Sub-tasks	Enabling Objectives	Tools & Equipment
19.02	Estimates cost and time of repair.	skill and experience of a proficient journeyman mechanic in the repair and replacement of seat mechanisms and hardware	labour flat rate manual parts catalogue & price list applicable repair manual
19.03	Makes damaged or faulty seat mechanisms accessible for removal by removing interfering upholstery and trim; and all covering, overlapping, and connecting parts.	skilled in using the applicable methods and tools for making the aforementioned mechanisms accessible for repair and replacement	small socket & wrench set screw drivers pliers and other special hand tools hog ring pliers
19.04	Detaches and removes seat mechanism by removing the retainment bolt, cap screw, clip, or other hardware.	skilled in using the applicable method and tools for removal of the aforementioned retainment hardware	same as in 19.03
19.05	Checks and prepares the replacement seat mechanism by: - insuring that the applicable mechanism is operating or functionable - lubricating applicable operating parts.	skilled in: - methods for checking the function of seat mechanisms - applying applicable lubricant to seat mechanisms requiring lubrication	lubricant applicator applicable holding fixture vise-grip pliers
19.06	Installs replacement seat mechanism by: - engaging and connecting operating parts - installing retainment hardware for securing the seat mechanism - replacing the parts and/or upholstery that was removed to facilitate the replacement - cleaning upholstery and trim (if applicable).	skilled in using the applicable methods and tools for installing the seat mechanism and aforementioned parts and hardware, and for cleaning upholstery	same as in 19.03 with the addition of: upholstery cleaner applicator

Performance Standard: to be completed by the user (see note on page xvi)

Task 20 Removes and replaces broken or weakened seat springs and integral seat frame and spring assembly.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year (specialized skill in the repair and replacement of seat frames and upholstery, with infrequent demand).

Trend: To replace seat spring frame assembly rather than repair them. A large percentage of this type of repair is being sub-let to the specialty auto upholstery and seat repair shops. (D1) activity measure represents that of the auto body mechanics only.

Sub-tasks	Enabling Objectives	Tools & Equipment
20.01 Examines the failure or breakage in the seat springs or spring frame and determines the repair or replacement action necessary to restore the original strength, shape, and function to the assembly.	knowledgeable in both function and methods of replacing seat springs and integral seat frame and spring assemblies	
20.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in repairing and replacing seat frames, springs, and upholstery	labour flat rate manual parts catalogue & price list applicable repair manual
20.03 Makes seat springs or spring frame accessible for replacement by: - removing seat assembly from the vehicle (when necessary) - removing interfering (obstructing) hardware, upholstery, padding, and trim; and all covering, overlapping, and connecting parts.	skilled in using applicable methods and tools for: - removing seat assembly from the vehicle - removing the aforementioned interfering parts	wrench & socket set hex wrench set screw drivers hog ring tools pliers upholstery holding vise-grip pliers applicable manual
20.04 Detaches and removes seat springs that are weak or broken.	skilled in using the applicable methods and tools for detaching, checking, and testing the springs	weight type spring tension tester pliers and other applicable hand tools

Sub-tasks	Enabling Objectives	Tools & Equipment
20.05 Replaces faulty or removed seat springs into spring frame assembly by positioning and securing to frame; replaces irreparable integral seat frame and spring assembly. (For repair of seat frame, refer to task 18.03).	skilled in using the applicable methods and tools to replace the aforementioned seat assemblies	weight type spring tension tester pliers and applicable hand tools
20.06 Reinstalls seat upholstery to the repaired or replacement seat spring and frame assembly by: - reinstalling the padding and all supporting parts - positioning and refitting upholstery to seat structure (spring & frame assembly) and installing retainment hardware - replacing side panels and trim and/or hardware - cleaning upholstery, if applicable at this time.	skilled in using the applicable methods and tools for installing upholstery and reassembling the aforementioned seat structures	upholstery cleaner applicator hex wrenches small socket & wrench set screw drivers pliers hog ring pliers upholstery clamps
20.07 Installs reassembled seat spring and frame structure into the vehicle; cleans upholstery.	skilled in using the applicable methods and tools for installing seat assembly into the vehicle, and cleaning upholstery	applicable wrenches, sockets & screw drivers upholstery cleaner applicator

Performance Standard: to be completed by the user (see note on page xvi)

BLOCK E UPHOLSTERY, LINING, TRIM

Task 21 Repairs or replaces damaged or worn seat upholstery (vinyl and/or fabric), padding, and other support materials.

Activity Measure: (D1) - 25% or less of the labour force perform this task more than once a year (specialized skill in repair and replacement of seat upholstery).

Trend: To replace seat upholstery rather than repair it. A large percentage of seat upholstery repair or replacement is sub-let to the specialized auto upholstery and seat repair shops - Vinyl welding patch repair is done almost exclusively by the specialty shops - Portional replacement of seat upholstery and stitching is done exclusively by the specialty shops. (D1) activity measure is applicable to the auto body mechanic only.

Sub-tasks	Enabling Objectives	Tools & Equipment
21.01 Examines the worn or damaged seat upholstery and determines the repair or replacement action required to restore the original strength, shape, function and appearance.	knowledgeable in methods for repairing and replacing seat upholstery	
21.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman upholsterer in the repair and replacement of auto and truck seat upholstery	labour flat rate manual applicable catalogue price list & repair manual
21.03 Makes seat upholstery accessible for repair or replacement by: - removing seat assembly (back and/or bottom) from vehicle if necessary - removing the interfering handles and side trim panel; and all covering, overlapping, & connecting parts.	skilled in using the applicable methods and tools to make the upholstery accessible	socket & wrench set screw drivers hex wrench set pliers
21.04 Removes seat upholstery by: - detaching the retainment hardware (hog rings) - pulling or lifting from seat assembly.	skilled in using the applicable methods and tools for removing the upholstery	hog ring tools pliers and other special upholstery tools
21.05 Prepares seat for replacement of upholstery by removing and replacing padding (spongerubber, cotton, or other material).	skilled in using the applicable methods for replacing the aforementioned padding	pliers

Sub-tasks	Enabling Objectives	Tools & Equipment
21.06 Installs repaired or replacement seat upholstery onto the seat assembly by: - positioning and refitting the upholstery to conform with the seat structure assembly (including accessory type seat cover) - installing upholstery retainment hardware (hog rings and/or others) - cleaning upholstery, if applicable.	skilled in: - applicable methods and tools for fitting and installing upholstery to seat frame - cleaning seat upholstery with applicable cleaning solution	hog ring tools pliers and other special upholstery tools upholstery cleaner applicator
21.07 Reinstalls seat back and/or bottom into vehicle as an assembly (when applicable) or individually.	skilled in using the applicable methods and tools for installing seat structures	socket & wrench set screw drivers hex wrench set pliers
21.08 Replaces side trim panel, handles, and all other retainment hardware; cleans upholstery.	skilled in using the applicable methods and tools for replacing the aforementioned parts and hardware previously removed	same as in 21.07

Performance Standard: to be completed by the user (see note on page xvi)

Task 22 Removes, repairs and replaces damaged or worn head linings (upholstered, vinyl, moulded fiber glass, and all other types).

Activity Measure: (D1) - 25% or less of the labour force perform this task more than once a year (specialized skill in the repair and replacement of head linings, with infrequent demand).

Trend: To replace rather than to repair the head linings. Repairs that are performed by auto body mechanics are of a very minor nature. A large percentage of this repair is being sub-let to the specialty auto upholstering shops. (D1) activity measure represents that of the auto body mechanics only.

Sub-tasks	Enabling Objectives	Tools & Equipment
22.01 Examines the worn or damaged head lining and determines the repair or replacement action required to restore the original strength, shape, and appearance.	knowledgeable in methods for repairing and replacing head linings	
22.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman upholsterer in the repair and replacement of auto and truck head linings	labour flat rate manual applicable catalogue & price list repair manual
22.03 Completes minor repair to head lining in the installed position by: - retucking loose head lining material - reattaching with adhesive.	skilled in using the applicable methods and tools to repair head lining	dull putty knife & rubber mallet plastic wedge tool adhesive applicator
22.04 Makes upholstered and/or moulded head lining accessible for removal by: - removing head lining and applicable window mouldings, seat belt anchors, mirror, sun visors, dome light assembly, pillar trim panels, and front and/or back window (on some models) If moulded heading, these steps are also required: - reclining or removing front seat - removing steering wheel.	skilled in using the applicable methods and tools for removing the aforementioned parts	screw drivers socket & wrench set steering wheel puller
22.05 Removes upholstered type head lining from the vehicle by: - pulling on head lining to detach the retainment adhesive - detaching head lining from the saw teeth or tabs in the retainment rail - detaching other forms of retainment - removing head lining listing wires from the roof rails.	skilled in using the applicable methods and tools for removal of head lining	blunt putty knife & rubber mallet plastic wedge tool applicable body manual

Sub-tasks	Enabling Objectives	Tools & Equipment
22.06 Prepares for installation of replacement head lining (upholstered type) by: <ul style="list-style-type: none"> - insuring that the retainment saw tooth points, or tabs, are in the correct position (if applicable) - insuring that the retainment area is cleaned for the application of fresh adhesive - securing roof insulation and padding - placing and centering listing wires in the listings in head lining - stretching the head lining tight and rastening the listings to each end of the listing wire. 	skilled in using the applicable methods and tools for preparation of head lining installation	pliers screw drivers cleaning solvent applicator brush putty knife adhesive applicator
22.07 Installs upholstered type head lining into vehicle by: <ul style="list-style-type: none"> - starting installation at the proper location (rear or front, whichever is applicable) - installing the listing wires into the roof rail - stretching, fitting, and securing head lining by attaching to window header tabs, tucking into side rail, and/or applying adhesive - cutting hole in head lining for domelight; trimming away access head lining material. 	skilled in using the applicable methods and tools for installing the aforementioned head lining. Knowledgeable of electrical wiring systems in roof areas	applicable body manual blunt putty knife & rubber mallet plastic wedge tool pinking shears scissors brush
22.08 Replaces the components that were removed to make the head lining accessible for removal.	skilled in using the applicable methods and tools for replacing head lining components	screw driver socket & wrench set
22.09 Removes moulded type head lining from the vehicle by: <ul style="list-style-type: none"> - detaching the head lining side rail J-type moulding or other retainment - detaching head lining support bows (if applicable). 	skilled in using the applicable methods and tools for removal of moulded type head lining	screw driver pliers putty knife

Sub-tasks	Enabling Objectives	Tools & Equipment
22.10 Prepares for installation of replacement head lining (moulded type) by: <ul style="list-style-type: none"> - insuring that roof panel padding or insulation is secured - insuring that the retainment area and holes are clean - fitting and installing support bows (if applicable). 	skilled in using the applicable methods and tools for preparing for the aforementioned installation	adhesive applicator cleaning brush pliers screw drivers
22.11 Installs moulded type head lining into vehicle by: <ul style="list-style-type: none"> - positioning, aligning and fitting to roof panel - attaching bows and other support parts - placing and attaching the head lining into side rail retainment by using J-type moulding or adhesive. 	skilled in using the applicable methods and tools for installing the aforementioned head lining	screw drivers pliers adhesive applicator
22.12 Replaces the components that were removed to make the head lining accessible for removal (as applicable to the type of vehicle).	skilled in using the applicable methods and tools for replacing head lining components	screw drivers socket & wrench set
22.13 Cleans upholstered or vinyl type head linings by: <ul style="list-style-type: none"> - determining the type of material to be cleaned - selecting the correct type of cleaner and/or stain removal solution - removing the dust from head lining with upholstery brush and/or vacuum cleaner - applying cleaning solution with a polyurathane sponge, in a light circular motion, to head lining and wiping with a clean white cheese cloth. 	skilled in using the aforementioned methods, tools, and solutions for cleaning upholstered and vinyl type head linings	cleaner solution applicator upholstery brush vacuum cleaner sponge cheese cloth

Sub-tasks	Enabling Objectives	Tools & Equipment
22.14 Cleans moulded fiber glass head lining by: - determining the correct type of cleaner and method of application - removing the dust from the head lining with a soft upholstery brush or a soft dusting cloth - lightly applying a piece of masking tape to the soiled spot and removing - applying cleaner (solution) to the head lining.	skilled in using applicable methods, tools, and solutions for cleaning moulded fiber glass head linings	masking tape cleaner solution applicator soft upholstery brush sponges cheese cloth

Performance Standard: to be completed by the user (see note on page xvi)

Task 23 Removes, replaces and cleans interior door trim panel (including arm rest).

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year (basic skill in interior trim panel replacement, with infrequent demand).

Trend: To replace rather than repair.

Sub-tasks	Enabling Objectives	Tools & Equipment
23.01 Examines the worn or damaged interior door trim panel and determines the replacement action required to restore the original strength, shape and appearance.	knowledgeable in methods for replacing interior door trim panels and arm rests	
23.02 Estimates time and cost of replacement.	skill and experience of a proficient journeyman mechanic in replacing interior door trim panels	labour flat rate manual parts catalogue & price list repair manual

Sub-tasks	Enabling Objectives	Tools & Equipment
23.03 Makes the panel accessible for removal by removing inner door handle, window winders, ashtray, arm rest, remote mirror control, power window switches and all other interfering part or accessory.	skilled in using the applicable methods and tools for removing the aforementioned parts	screw drivers pliers hex wrench set special handle & winder removing tools
23.04 Removes panel from door by: - removing retaining screws and/or moulding - prying between door trim panel and door to detach the panel & clips from the door.	skilled in using the applicable methods and tools for removal of the aforementioned trim panel	trim panel tools screw drivers
23.05 Prepares for installation of replacement door trim panel by: - cleaning inside of door with a cloth & solvent - replacing door water dam (when applicable) - attaching and aligning the retainment clips into the correct position in the door trim panel.	skilled in using the applicable methods and tools for preparation of the trim panel installation	pliers screw drivers cleaning cloth putty knife
23.06 Installs door trim panel onto door by: - positioning panel and aligning clips to the corresponding installation holes in door - pressing panel clips into holes in door for securing the panel - installing retainment screws and/or mouldings.	skilled in using the applicable methods and tools for installing the aforementioned trim panel	screw drivers pliers
23.07 Replaces the components (parts) that were removed to make the interior door trim panel accessible for removal.	skilled in using the applicable methods and tools for installing the aforementioned parts	same as in 23.03
23.08 Cleans door trim panel.	refer to task 26	Refer to task 26

Performance Standard: to be completed by the user (see note on page xvi)

Task 24 Repairs, cleans, or replaces vinyl roof covering, or completes an initial instalation.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year (specialized skill in repair and replacement of vinyl roof coverings, with infrequent demand).

Trend: A large percentage of body shops are sub-letting all vinyl cover repair or replacement to the specialty shops. Specialty shops perform almost all of the initial installations and the recolouring of faded vinyl roof coverings.

Sub-tasks	Enabling Objectives	Tools & Equipment
24.01 Examines the worn or damaged vinyl roof covering and determines the repair or replacement action required to restore the original strenth and appearance.	knowledgeable in methods for repairing and replacing vinyl roof coverings	
24.02 Estimates time and cost of repair or installation of new vinyl covering.	skill and experience of a proficient journeyman trim mechanic in the repair and replacement of vinyl roof coverings	labour flat rate manual parts catalogue & price list body manual
24.03 Completes minor repair to the vinyl roof covering in the installed position by: - chemically welding cuts and tears with an electric heating tool - piercing bulges or bubbles in the cover with a stick pin to expel trapped air - applying heat to reactivate adhesive so as to refit and rebond the vinyl to the roof - reapplying adhesive to rebond vinyl to roof - resealing drip rail with applicable sealer material (silicone or urethane rubber).	skilled in using the applicable methods and tools for completing minor repairs	electric heating tool, with attachment for welding vinyl heat lamp adhesive applicator & injection type applicator drip rail sealer applicator stick pin

Sub-tasks	Enabling Objectives	Tools & Equipment
24.04 Recolours and restores finish to vinyl roof cover by: <ul style="list-style-type: none"> - cleaning vinyl with a heavy duty vinyl cleaner - applying masking to protect paint and glass - spraying vinyl lightly with a coating of activating primer - selecting or mixing the desired colour of vinyl paint - applying a cover coating of vinyl paint to the vinyl cover, using a spray gun. 	skilled in using the applicable methods and tools for recolouring and restoring the vinyl cover	vinyl cleaner applicator paint spray gun masking tool paint mixing tool
24.05 Makes vinyl roof cover accessible for removal by: <ul style="list-style-type: none"> - removing trim mouldings - removing sealing material from inside drip rail and from the edges of vinyl at front and rear window openings - removing front and/or rear windshield glasses to gain access for the removal of the vinyl cover retention drive nails (applicable to vehicles with this type of installation only). 	skilled in using the applicable methods and tools to make the vinyl cover accessible for removal	screw drivers special moulding removal tools pliers window tools
24.06 Removes vinyl roof covering by pulling and peeling cover from panel and applying aromatic solvent where necessary.	skilled in using the applicable methods and tools to facilitate the aforementioned removal	solvent applicator blunt putty knife
24.07 Prepares roof panel for installation of vinyl roof covering by: <ul style="list-style-type: none"> - removing old adhesive - assuring surface is free of irregularities (rust) - measuring and marking centre line above the windshield and rear window openings. 	skilled in using the applicable methods and tools for preparation of the aforementioned installation	same as in 24.06

Sub-tasks	Enabling Objectives	Tools & Equipment
<p>24.08 Installs and secures the vinyl covering to the roof panel by:</p> <ul style="list-style-type: none"> - placing, aligning and centering vinyl covering on the roof panel - applying a piece of masking tape to vinyl cover & roof to secure position - folding half the vinyl cover back at the predetermined centre line - applying a coating of adhesive to the open half of roof panel and vinyl cover with a spray gun or brush - allowing adhesive enough drying time to become tacky - applying open half of cover to corresponding open half of roof panel, starting at centre line and working toward the side by using a roller, sponge, or soft cloth to press and insure a positive bond, also to eliminate air pockets. 	<p>skilled in using the applicable methods and tools for installing the vinyl cover</p>	<p>paint spray gun paint brush paint roller soft cloth sponge</p>
<p>24.09 Fits, cuts, and trims the vinyl cover at the drip rails, window openings, pillars, and at the position of retention mouldings.</p>	<p>skilled in using the applicable methods and tools to fit and trim the vinyl covering</p>	<p>fabric cutting knife scissors screw drivers</p>
<p>24.10 Seals the vinyl cover in the drip rails, window openings, pillars, and at the position of retention mouldings with and applicable sealing material.</p>	<p>skilled in using the applicable methods and tools to seal the vinyl covering</p>	<p>drip rail sealer applicator adhesive applicator screw drivers</p>
<p>24.11 Replaces the components and parts that were removed to make vinyl roof cover accessible for removal.</p>	<p>skilled in using the applicable methods and tools for replacing the aforementioned components and parts</p>	<p>screw drivers special moulding tools pliers window tools</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
24.12 Cleans vinyl roof cover, if and when applicable by: - applying vinyl cleaner - wiping clean with a damp sponge.	skilled in using the aforementioned methods, tools, and solutions for cleaning vinyl roof coverings	vinyl cleaner applicator brush sponge

Performance Standard: to be completed by the user (see note on page xvi)

Task 25 Removes, repairs, and replaces convertible top, including rear window, frame structure, weather seals, and mechanisms.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year (specialized skill in repairing and replacing convertible top assembly, with infrequent demand).

Trend: Almost all of the body shops sub-let the repair or replacement of convertible tops to the specialty shops. (D1) activity measure is applicable only to the small percentage of auto body shops that perform this repair.

Sub-tasks	Enabling Objectives	Tools & Equipment
25.01 Examines the worn or damaged convertible top and/or mechanism to determine the repair or replacement action required to restore the original strength, shape, function and appearance.	knowledgeable in methods for repairing and replacing convertible top, frame, weather seals and mechanisms	
25.02 Estimates time and cost of repair or replacement.	skill and experience of a proficient journeyman upholsterer and mechanic in repairing and replacing convertible tops, frame, weather seals and mechanisms	repair manual labour flat rate manual parts catalogue & price list

	Sub-tasks	Enabling Objectives	Tools & Equipment
25.03	<p>Makes the convertible top, support frame, bows, header, hinges & mechanisms accessible for removal and/or repair by; detaching the convertible top fasteners or other forms of retainment; removing or disconnecting other interfering parts.</p>	<p>skilled in using the applicable methods and tools for making the aforementioned repair or replacement accessible</p>	<p>screw drivers pliers wrench & socket set</p>
25.04	<p>Straightens and secures loose, misaligned, or slightly damaged convertible top support parts, and operating mechanisms by:</p> <ul style="list-style-type: none"> - adjusting and tightening position - straightening by applying pressure and/or controlled heat - welding crack or break. 	<p>skilled in using the applicable methods and tools for facilitating the aforementioned repairs</p>	<p>screw drivers wrench & socket set pinch bar oxy-acetylene torch electric welder pliers</p>
25.05	<p>Removes and replaces irreparable convertible top support parts and operating mechanisms (including hinge(s) & latches) by:</p> <ul style="list-style-type: none"> - removing the retainment snapfasteners, bolts, screws, clips, and all hardware - fitting, aligning, and connecting replacement support part and/or mechanism - replacing the retainment bolts, screws, clips, and hardware - attaching new support pads to bows and other support areas. 	<p>skilled in using the applicable methods and tools for removal and replacement of the aforementioned parts and mechanisms</p>	<p>socket & wrench set screw drivers pliers pinch bar</p>
25.06	<p>Removes convertible top window (when applicable) by:</p> <ul style="list-style-type: none"> - detaching window zipper from the convertible top or other form of window opening device - removing stitching from retainment flange - freeing the adhesive bond from window retainment. 	<p>skilled in using the applicable methods and tools for removing window from convertible top fabric</p>	<p>stitch removing tool knife</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
25.07 Replaces convertible top window by: <ul style="list-style-type: none"> - applying adhesive to bond the window retainment flange to the top - restitching window retainment flange, and applying weather sealing - attaching window zipper, or other form of window opening device, to the convertible top. 	skilled in using the applicable methods and tools for reinstalling window into convertible top fabric	sewing machine adhesive applicator
25.08 Removes rubber weather seals from the convertible top, header support frame, and/or other locations by: <ul style="list-style-type: none"> - removing the retainment screws and clips (hardware) - pulling on the weather seal and breaking the bond of the adhesive or cement. 	skilled in using the applicable methods and tools for removing the aforementioned weather seals	screw drivers small wrench & socket set pliers putty knife
25.09 Removes useable tack strips from the old top, and reinstalls them into new convertible top by stapling.	skilled in using the applicable methods and tools for removing and replacing tack strips, and stapling	pliers screw drivers stapler
25.10 Installs rubber weather seals onto the convertible top, header support frame, and/or other locations by: <ul style="list-style-type: none"> - cleaning installation location - applying adhesive - placing, fitting, and installing retainment screws and clips. 	skilled in using the applicable methods and tools for installing the aforementioned weather seals	cleaning solvent brush adhesive applicator screw drivers pliers wrench & socket set
25.11 Installs convertible top by: <ul style="list-style-type: none"> - fitting the top covering to the roof bows, header & supporting frame assembly, rear quarter & deck panels - installing screws, fasteners, staples, and quarter belt mouldings; applying adhesive to secure top covering to the quarter panel, deck panel, and the header & supporting frame assembly 	skilled in using the applicable methods and tools for installing the convertible top	same as in 25.10 with addition of lining tools and supporting fixtures

Sub-tasks	Enabling Objectives	Tools & Equipment
25.11 - replacing weather seals, Cont. where applicable (refer to sub-task 26.10) - aligns, adjusts, and lubricates hinges & latches (when applicable).		
25.12 Replaces the parts and mechanism(s) that were removed or disconnected to make the convertible top and mechanisms accessible for repair or replacement; insures operation of opening & closing mechanism; checks for wind noise & water leaks.	skilled in using the applicable methods and tools for replacing the aforementioned parts and mechanism(s)	screw drivers pliers wrench & socket set water hose
25.13 Cleans convertible top by: - lightly brushing away residue & dust and washing off film - rinsing top thoroughly with clean water, and allowing it to dry under protection.	skilled in using the aforementioned methods, tools, and solution for cleaning convertible top fabric	water hose wash pail sponge wisk broom

Performance Standard: to be completed by the user (see note on page xvi)

Task 26 Cleans interior upholstery, including carpet.

Activity Measure: (D1) - 25% or less of the work force perform this task more than once a year (specialized skill in cleaning automotive upholstery and interior trim, with infrequent demand).

Trend: Almost all of the body shops sub-let cleaning of upholstery to the specialty shops or used car reconditioning departments; it is not generally economically feasible for auto body mechanics to perform this service. (D1) activity is applicable to the auto body shop mechanics only.

Sub-tasks	Enabling Objectives	Tools & Equipment
26.01 Examines the condition and types of upholstery to be cleaned, and determines the methods, tools, equipment, and cleaning materials that are required for cleaning and restoring the upholstery appearance.	knowledgeable in determining the various types of interior upholstery materials to be cleaned	upholstery cleaning manual
26.02 Estimates cost of cleaning.	skill and experience of a proficient upholstery cleaning technician	upholstery clean-up price list
26.03 Prepares upholstery for cleaning and/or shampooing by: - loosening firm dirt or foreign material with a brush and/or compressed air (when applicable) - cleaning various interior upholsteries with a vacuum cleaner and applicable cleaning attachments (not used on vinyl or moulded fiber glass headlinings).	skilled in using the applicable methods and tools for the aforementioned upholstery preparation	vacuum cleaner upholstery brush compressed air bristle brush
26.04 Removes spots or stains from upholsteries by applying the predetermined method and type of stain removing solution.	skilled in using the applicable methods and tools for removal of stains (toxicity of cleaning agents)	sponge stain remover applicator brush
Note: For the cleaning of moulded fiber glass head linings, refer to sub-task 22.14.		
26.05 Cleans interior upholsteries by: - selecting or mixing the type of cleaner or shampoo that is required - applying cleaning agent and brushing with a power applicator & brush attachment, or with a suitable sponge and hand brush	skilled in using the applicable methods and tools for cleaning upholstery	cleaning material applicator power applicator & brush unit hand brush sponges wiping towels wet & dry vac

Sub-tasks	Enabling Objectives	Tools & Equipment
26.05 - vacuuming out suds from Cont. fabric upholstery and wiping down with a towel or damp sponge - wiping off cleaning material or suds from vinyl or leather.		
26.06 Applies dress coating to vinyl or leather with a damp sponge.	skilled in using the applicable methods and tools for dressing the aforementioned upholsteries	dressing material applicator sponge cheese cloth

Performance Standard: to be completed by the user (see note on page xvi)

BLOCK F FIBERGLASS

Task 27 Repairs and refinishes fiberglass bodies (including panel and supporting structure replacement).

Activity Measure: (D3) - 25% or less of the work force perform this task more than once a week (specialization, with a reasonably small demand in most of the trade locations. This measure is applicable to the small percentage of body shops which are performing repairs to fiberglass bodies).

Note: this activity measure will likely increase if the present trend toward manufacturing fiberglass bodies continues.

Trend: Specialization of fiberglass repair continues within the operations of a small percentage of the general type auto body repair shops. There are very few shops which can be considered exclusive fiberglass auto body repair shops, so it is necessary for a large percentage of the shops to sublet the repair to those shops which do perform this specialized repair. Fiberglass repair skill is being increasingly utilized also in skidoo and boat repair shops.

Note of interest: refer to attachment in regards to fiberglass refabrication plant.
(page).

Sub-tasks	Enabling Objectives	Tools & Equipment
27.01 Examines the damaged or defective areas of fiberglass body panels and other structures, and determines the repair and/or replacement action required to restore the original strength, shape, and function.	knowledgeable in the assembly, structure, and repair of vehicles with fiberglass bodies	fiberglass auto body repair manual
27.02 Estimates time and cost of repair.	skill and experience of a proficient journeyman mechanic in repair, replacement, and refinishing of fiberglass bodies	labour rate chart material & parts catalogue and price list body manual
27.03 Co-ordinates the repair of fiberglass bodies with the repair of the frame and/or other related components of the vehicle.	knowledgeable in methods for co-ordinating fiberglass body repairs to the vehicle	
27.04 Prepares damaged fiberglass body panels and/or other fiberglass body components for repair or replacement by: <ul style="list-style-type: none"> - removing mouldings, sound deadening material, and other interfering parts - cleaning both sides of the surface around the damaged area to be repaired - sanding the repair area to remove all paint & primer - cutting and grinding away all splintered fiberglass from the edges of holes or cracks in the body - determining the correct location for removal of damaged area, and scribing or marking it for cut-out - cutting out damaged area - beveling the edges of holes, cracks, and joints on both sides (when accessible) with a disc grinder held at the right angle, so as to provide 	knowledge of fiberglass body strength versus thickness relationship will enable the ability to determine the correct angle and width of bevel to be ground into fiberglass body structure skilled in: <ul style="list-style-type: none"> - cutting fiberglass body structure with a hack, hole, or jig saw - sanding & grinding fiberglass body structures with applicable sander or grinder - importance of wearing and method of using safety goggles, gloves, and applicable respirator 	fiberglass body manual disc grinder & sander hole saw hack saw jig saw safety goggles gloves respirator

Sub-tasks	Enabling Objectives	Tools & Equipment
27.04 Cont. the required recess area for the application of resin and the correct lay-out of fiberglass cloth (or mat) to rejoin the body structure.		
27.05 Constructs forms (or moulds) to enable the replacement of the damaged portion of a fiberglass body (with a curvature or other critical shape), by measuring, cutting, and shaping a piece of wire mesh for formation of a mould, which will conform to the original curvature of the body.	skilled in measuring and shaping a mould or form to conform with a critical body shape (curvature)	measuring tape metal shears
27.06 Attaches the shaped (moulded) wire mesh form with pop rivets, sheet metal screws, or epoxy, to the fiberglass body, so as to support and correctly shape (form) the lay-out of fiberglass cloth, mat, and resin for replacement of irreparable portions of the body.	skilled in using the applicable methods and tools for attaching a moulded wire mesh form to the applicable repair and replacement location	drill & bits screw drivers riveting tool epoxy applicator
27.07 Prepares bonding strips or plates for use by: <ul style="list-style-type: none"> - measuring and cutting applicable bonding material to the size and shape required for re-bonding fiberglass to cracks, holes, panels, and other structures - coating or covering the side that supports the lay-out of fiberglass cloth, mat, and resin, with a release agent such as an emulsion wax or wax coated paper - drilling holes in strip, when required for installation. 	knowledgeable in: <ul style="list-style-type: none"> - types of materials used for making bonding strips for the various types of fiberglass body repairs - selection of a suitable bonding material for a specific repair skilled in: <ul style="list-style-type: none"> - measuring, cutting, and shaping the applicable bonding material for a specified repair - applying wax type release agent coating or covering to bonding strips 	hand cutting saw metal shears jig saw hole saw wax dispenser

	Sub-tasks	Enabling Objectives	Tools & Equipment
27.08	Installs premeasured and prepared bonding strips onto the body for repair of cracks and holes, by means of attaching with rivets or sheet metal screws.	skilled in using the applicable methods and tools for fitting, shaping, and attaching bonding strips so as to facilitate the aforementioned installation	rivet tool drill & bits screw drivers clamps
27.09	Aligns, fits, and attaches replacement panel into the vehicle body, to enable the lay-out of fiberglass and resin by: - measuring and aligning to adjacent panel or other related structures - cutting and grinding when necessary - attaching panel to body with clamps or small bolts & nuts with large flat washers, on inner and outer surface of panel - installing preshaped bonding strips to panel and body structure with either pop rivets or drilling and installing sheet metal screws.	skilled in using the applicable methods and tools for aligning, fitting, and attaching the aforementioned panel	diagonal measure device measuring tape disc grinder hole, hack, & jig saws safety goggles gloves respirator
27.10	Cleans repair surface before applying resin and fiberglass, by means of cleaning with a non oily solvent (lacquer thinner).	skilled in using the applicable method and tools for cleaning repair surface	shop cloth cheese cloth compressed air
27.11	Prepares cloth, mat, and/or chopped strand type fiberglass materials for application by measuring and cutting the smallest piece of the fiberglass lay-out first, so as to overlap a small portion of the bevel at lay-out join, and repeats again by cutting slightly larger (overlapping) pieces of fiberglass until the required fiberglass lay-out thickness for the repair is accomplished.	knowledgeable in: - types of fiber material used for repairing vehicle bodies - selection of the applicable type of fiberglass material for specific repairs - methods for determining the quantity and thickness of fiberglass material to be applied	gloves shears measuring tape

Sub-tasks	Enabling Objectives	Tools & Equipment
27.11 Cont.	skilled in measuring, cutting (tearing), and fitting fiberglass material for a specific repair	
27.12 Prepares resin for application by: - filling an application container with the amount of resin required to complete the fiberglass repair, or when applicable, only the amount that can be applied within the resin setting up (hard- ening) time - adding a predetermined amount of catalyst to the resin and mixing thoroughly - allowing approx. 3 to 4 minutes for catalyst to react on the resin before applying resin to fiberglass.	knowledgeable in: - area method for calculating the amount of resin required to saturate the number of layers of fiber- glass cloth and/or mat required for completing the lay- out of fiberglass on all types of repair or replacement - how to determine, from practical experience, the amount of resin that can be applied to an applicable repair within the predetermined harden- ing time skilled in: - adding & mixing the correct amount of catalyst into a pre- determined amount of resin to enable the required resin hardening time - determining the time required for the catalyst to react in the resin before applying to the repair - importance of wearing and method of using gloves, and an organic or fresh air type respirator to prevent lung and physical damage	fiberglass auto body manual resin & catalyst specifications application container measuring tape gloves respirator

Sub-tasks	Enabling Objectives	Tools & Equipment
<p>27.13 Rejoins, re-forms, and bonds body with fiberglass lay-out at location of cracks, holes, replacement panel (or other structure) and in the location for re-forming a portion of the fiberglass body with a curvature or critical shape by:</p> <ul style="list-style-type: none"> - putting on rubber gloves and respirator and insuring that the resin and work area are both at a desirable temperature for application and bonding - saturating a small paint roller or brush with premixed resin and hardener from the application container - applying a light coating of the premixed resin, with a roller or brush, to the predetermined starting location in the fiberglass lay-out area - applying and working the prefitted fiberglass material into the applied resin on the lay-out surface (with a roller or brush) to insure a firm lay-out of fiberglass with the required amount of resin saturation for bonding; removes excess resin - repeating resin and fiberglass applications until all the prefitted fiberglass material is applied (in the predetermined sequence); after the required build-up of fiberglass is accomplished removes bonding strips with release agent, and structure supporting fixtures - again laying-out the fiberglass on the opposite side (if applicable) 	<p>skilled in using the applicable methods and tools for applying prefitted fiberglass to facilitate the aforementioned repair, and thereby restoring the original or required strength, thickness, shape, and function to the body. Aware of fire hazards related to unused activated resins</p>	<p>applicable paint roller & brush resin application container gloves respirator tool cleaning tray</p>

Sub-tasks	Enabling Objectives	Tools & Equipment
27.13 - washing and cleaning resin Cont. applicator tools and container with lacquer thinner, before the resin hardens.		
27.14 Prepares area of fiberglass repair for repainting by: - shaping the surface of the reapplied fiberglass & resin to conform to body shape - filling small depressions and cavities in the surface by applying an epoxy (bondo) filler - removing excess epoxy filler material, by grinding, filing, and sanding - sanding the entire repair area with either an oscillating, orbital, and/ or feather edging sander, and by hand, with the applicable grits; cleaning in preparation of primer- surfacers application - applying a sufficient coating of the applicable primer-surfacer to the area to be repainted; finish sanding; cleaning accordingly for repainting - applying a primer bonding type of body putty to fill any nicks or scratches that may have been missed; finish sanding body putty; cleaning accordingly for repainting - placing the vehicle in the paint spray booth, and applying a light coating of epoxy (flash type primer-sealer, or other applicable sealer) onto the area of the vehicle to be repainted; allowing the required flash off time	skilled in using the applicable methods and tools for completing the aforementioned re- finishing of fiberglass body repair	paint spray gun disc grinder & sander oscillating or orbital sander feather edging sander putty knife plastic squeegee paint booth

Sub-tasks	Enabling Objectives	Tools & Equipment
27.14 Cont.	before repainting the vehicle, or repair area, with the applicable paint (top coat).	

Note: For repainting fiberglass bodies, or a portion thereof, refer to Task 30 and the applicable sub-tasks and enabling objectives.

Performance Standard: to be completed by the user (see note on page xvi)

Note of Interest: There is a fiberglass fabricating plant in Vancouver that fabricates the fiberglass cab, hood, and front end assemblies for a firm which manufactures a line of heavy duty trucks; this fiberglass fabrication firm also refabricates these fiberglass assemblies for repair of accident damage, by means of utilizing existing fabrication moulds, jigs, plant assembly equipment and original fabrication methods. This type of repair is done to these damaged assemblies only after they have been removed from the truck, at an auto or truck body shop, and delivered to the plant for repair & restoration. This fiberglass fabricating firm neither considers nor refers to this repair function, within the plant operation, as a fiberglass auto or vehicle body repair operation, due to the fact that the original plant equipment and methods are utilized to facilitate the repair; perhaps fiberglass refabrication could be an alternate description for this particular repair operation.

BLOCK G PAINTING

Task 28 Maintenance of the auto body shop, paint refinishing equipment, including the paint spray booth, bake oven, and paint preparation area of the shop.

Activity Measure: (D3) - 25% or less of the work force perform this task more than once a week (the general application of knowledge and skill in the maintenance of shop systems, equipment, and inventory required for refinishing and repainting auto bodies, with a reasonably frequent demand).

Note: this measure is not applicable for all the described maintenances, some will be less and others more often than that of (D3), due to the widely varying circumstances that are involved.

Trend:

	Sub-tasks	Enabling Objectives	Tools & Equipment
28.01	Maintains the air compressor by: <ul style="list-style-type: none">- cleaning air intake filter- checking the oil level- checking the maximum compressing pressure and draining the water from the air supply tank- checking drive belt tension and adjusting when required.	knowledgeable of the operational function, and in methods and standards recommended by the manufacturer for maintenance of the equipment. Skilled in applying the recommended maintenance, and in making visual inspections	applicable maintenance tools
28.02	Maintains the air regulator by: <ul style="list-style-type: none">- draining the water from the trap- cleaning the trap transformer and adjusting the air pressure.	same as in 28.01	
28.03	Cleans and maintains spray gun by: <ul style="list-style-type: none">- operating with the applicable cleaning material (solvent, thinner, or reducer), and cleaning restricted or plugged ports, passages, and nozzle- lubricating spray gun mechanism if and when required.	same as in 28.01	
28.04	Maintains air hoses by cleaning and inspecting physical condition and replacing when necessary.	same as in 28.01	
28.05	Maintains the spray booth and/ or bake oven, and insures safe operating conditions by: <ul style="list-style-type: none">- cleaning the exhaust fan and lubricating if applicable- cleaning or replacing oven & spray room filters- cleaning the spray & bake oven rooms and their lighting	same as in 28.01	

Sub-tasks	Enabling Objectives	Tools & Equipment
28.05 - replacing burned out Cont. light(s), heat lamp, or other type heating (drying system) if applicable - checking the operation of bake oven heating system.		
28.06 Maintains the respirator by replacing filters, cleaning, and caring for the exhaling valve.	same as in 28.01	
28.07 Maintains the grinding, sanding, and polishing equipment by: - cleaning, and insuring safe, normal operating conditions - replacing or installing proper discs & sand paper or pads.	same as in 28.01	
28.08 Maintains an inventory (supply) of all the materials required for refinishing and painting.	knowledgeable of - existing fire regulations pertaining to storage of volatile materials - a practical form of inventory control	applicable storage units
28.09 Maintains the paint mixing machine by cleaning & lubricating the formula proportioning devices.	same as in 28.01	
28.10 Maintains the shop ventilation system, and safety standards for handling volatile materials.	same as in 28.01	
28.11 Maintains the cleanliness of the auto body shop paint & refinishing areas, and also, maintains the health & safety trade standards.	skilled in using the applicable methods and tools for maintaining the aforementioned shop conditions	floor cleaning brooms vacuum cleaner floor squeegee applicable health & safety standard manual

Performance Standard: to be completed by the user (see note on page xvi)

Task 29 Prepares vehicle body for painting; refinishes and prepares the vehicle body, or a portion thereof, to enable the required condition for painting. (Refer to Task 28 for the refinishing of repaired fibreglass).

Activity Measure: (B4) - between 50% and 75% of the work force perform this task more than once a day (skill in auto vehicle body preparation for painting, with a reasonably frequent demand).

Trend:

Sub-tasks	Enabling Objectives	Tools & Equipment
29.01 Examines the condition of the body & paint, and ascertains whether the old paint is acrylic enamel or lacquer, or other synthetic type, and then determines the refinishing, preparation action, and materials required to restore the finish for repainting.	knowledgeable in how to determine the: - type of body material, such as; metal, alloy, plastic, or polyester fibreglass - condition of body material - type of paint on the vehicle - refinishing and preparing action that is required to restore the body finish for repainting	refinishing manual
29.02 Estimates the time and cost of refinishing (and painting, when applicable).	skill and experience of a proficient journeyman mechanic in refinishing vehicle bodies for painting	labour flat rate manual material price list body manual refinishing manual
29.03 Cleans old paint for refinishing by: - removing tars, waxes, silicones, and other foreign materials with an applicable cleaning agent - washing vehicle exterior, including door jambs & sills in the trunk, tailgate, and engine compartment, with soap (detergent) & water	skilled in using the applicable methods and tools for cleaning aware of safety when using compressed air	cleaning material applicators compressed air & blow gun wiping towels washing tools water hose

Sub-tasks	Enabling Objectives	Tools & Equipment
29.04 - applying primer-surface Cont. to the area to be painted		putty knife plastic
- applying a primer bonding type of body putty to fill nicks & scratches, and by sanding & cleaning accordingly		squeegee masking dispenser paint mixing equipment
- placing the vehicle into the spray painting booth for applying sealer coating to the entire area to be painted		spray painting gun
- spraying sufficient seal coverage to seal the old paint and primer surfacer, and cleans accordingly.		
29.05 Polishes newly applied lacquer paints with either a power polisher, or by hand, with applicable com- pound in order to obtain maximum lustre and appearance, and also for preparation of applying a clear pro- tective (urethane imron) type coating over applicable paints.	knowledgeable in the: - various types of compounds and the methods that are used for polishing with these compounds - types of paints that can be polished when newly applied and in those that cannot be polished without a sufficient predetermined harden- ing time skilled in using the applicable methods and tools for applying compound, and polishing newly applied lacquer or applicable paint finish	power polisher & various polishing wheels & buffers sponge cheese cloth

Performance Standard: to be completed by the user (see note on page xvi)

Task 30 Repaints refinished area of vehicle or the entire vehicle (including fibreglass bodies).

Activity Measure: (D4) - 25% or less of the work force perform this task more than once a day (specialized skill in repainting vehicle bodies, with frequent demand).

Trend: Continues with painting forming a large portion of the auto body trade. Painting of vehicle bodies, which generally includes the skills required for preparation of painting, continues to be a specialized occupation within the auto body trade.

Sub-tasks	Enabling Objectives	Tools & Equipment
30.01 Examines the condition of the body finish to insure that the body refinishing and preparations for painting have been completed satisfactorily, and ascertains which type of paint is to be applied.	knowledgeable in how to determine the: <ul style="list-style-type: none"> - type of body material, such as; metal, alloy, plastic or polyester fibreglass - condition of refinished body or area to be repainted - type of paint to be used for repainting 	refinishing manual
30.02 Estimates cost of painting, when applicable.	skill and experience of a proficient journeyman auto & truck painter (refinisher)	paint flat rate manual material price list
30.03 Grounds vehicle body to prevent static electricity, and removes dust and lint by use of a blow gun & tac rag.	skilled in using the applicable methods and tools for cleaning	compressed air & blow gun tac rags
Note: refer to sub-task 30.04 l&m for applying sealer (bleeder) coatings to seal old paint and primer surfaces.		
30.04 Maintains a compatible temperature in the painting area (paint spraying booth) for spraying & applying enamels, acrylics, lacquers, urathane, and other types of paint.	skilled in regulating the heating on air condition system to maintain a constant compatible temperature for painting	shop heating & ventilation system air condition- ing system
30.05 Prepares lacquer type paint for spraying by: <ul style="list-style-type: none"> - mixing and tinting to match vehicle colour - thinning with applicable thinner to obtain the 	knowledgeable in <ul style="list-style-type: none"> - how to determine the lacquer thinner which will have the required evaporation rate 	paint mixer paint measuring device paint formula system paint filler

	Sub-tasks	Enabling Objectives	Tools & Equipment
30.05 Cont.	proper viscosity for spraying - measuring and mixing the applicable additives into the paint - straining the paint when filling the spray gun container.	- method and reason for thinning lacquer paint - methods and reason for adding in retarder - methods for adding fish eye eliminator - methods for adding in a flexing agent for painting A.B.S. plastic and polypropylene skilled in using the applicable methods, tools, and equipment for preparing lacquer paints for spraying	
30.06	Applies lacquer paints (including metallic colours) with a paint spray gun by: - preadjusting the applicable air pressure & spray gun adjustments - spraying at proper distance for applying the required film thickness, and wetness - allowing required drying time, or a heat treatment, between coats of paint - manipulating the spray gun properly to enable blending in paint to match colour in an adjoining panel, or area of spot repair; removes masking tape while lacquer is still wet.	knowledgeable in: - operating function of the applicable spray painting gun - ventilating and lighting systems in the paint booth - allowing the required flash off time between the applications of lacquer skilled in using the applicable methods and equipment for applying lacquer type paints	spray painting gun respirator paint booth
30.07	Polishes newly applied lacquer after sufficient drying.	same as in 29.05	same as in 29.05
30.08	Applies a clear protective (urethane) coating to newly applied enamel, or other applicable paint, by means of spraying with the proper air pressure & spray gun adjustment; applying the required film thickness and	knowledgeable in the methods for mixing and preparing clear urethane paint skilled in using the applicable methods and equipment for applying clear urethane paint	paint mixer paint measuring device respirator spray paint gun paint booth

Sub-tasks	Enabling Objectives	Tools & Equipment
30.08 wetness, and allowing proper drying time (flash off) between coats.		
30.09 Prepares enamel & synthetic paints (including metallic colours) for spraying by: <ul style="list-style-type: none"> - insuring that the enamel is at the proper temperature for mixing and applying - mixing and tinting to match colour - thinning with applicable enamel reducer to obtain the desired viscosity for spraying - measuring the applicable additives into the paint - straining paint when filling spray gun container. 	knowledgeable in: <ul style="list-style-type: none"> - how to determine the enamel reducer which will have the required evaporation rate - method and reason for reducing enamel paint - method and reason for adding hardener - method for adding fish eye eliminator - method for adding antiwrinkle converter skilled in using the applicable methods, tools, and equipment for preparing enamel paints for spraying	paint mixer paint measuring device paint formula system paint filler
30.10 Applies enamel & synthetic paints (including metallic colours) with a paint spray gun by: <ul style="list-style-type: none"> - preadjusting the applicable air pressure & spray gun adjustments - spraying at the proper distance (position) for applying the required film thickness & wetness - allowing the required drying time, or heat treatment, between coats - allowing additional flash off time when spraying coats of enamel to fibreglass bodies. 	knowledgeable in: <ul style="list-style-type: none"> - operating function of the applicable spray painting gun - ventilating and lighting system in the paint booth - allowing the required flash off time between applying coats of enamel skilled in using the applicable methods and equipment for applying enamel type paints	spray painting gun respirator paint booth
30.11 Force dries paint by placing the vehicle into the bake oven, and setting the controls at the applicable heat level and length of time for safely expediting the drying process for enamel & lacquer paints.	knowledgeable in the operating function of the bake oven for force drying paints and sealer coating skilled in using the applicable methods for operating the bake oven	bake oven

Sub-tasks	Enabling Objectives	Tools & Equipment
30.12 Removes all masking material and protective coverings, at the applicable times after painting lacquer and enamel top coats. (including clear coatings).	skilled in using the applicable method(s) for removing masking tape	
30.13 Installs pin striping when applicable, and replaces removed mouldings and ornamentations; prepares vehicle for customer.	skilled in replacing striping and mouldings	pin striping applicator moulding tools screw drivers small wrench & socket set

Performance Standard: to be completed by the user (see note on page xvi)

THE APPENDICES

APTITUDES AND CAPACITIES

Motor vehicle Body Repairers usually require:

- learning ability to understand motor-vehicle repair-manual instructions and specifications and underlying principles of automotive vehicle construction and operation, and to use this knowledge to repair and service motor vehicles;
- spatial perception to understand and visualize relationships and arrangement of parts in automotive mechanisms and assemblies;
- form perception to detect faults in parts when assembling and adjusting motor-vehicle electrical and mechanical components and to observe and compare slight differences in shapes and dimensions;
- eye-hand co-ordination and finger dexterity to handle small objects, to use hand tools to assemble and adjust parts and to use precision equipment to test component parts or vehicle performances;
- manual dexterity to move the hands easily and skilfully when placing parts, making adjustments and tightening screws and nuts;
- strength to perform medium to heavy work requiring frequent lifting of assemblies weighing up to fifty pounds, and torquing nuts and bolts to specified foot-pounds;
- agility to work under or around vehicles in awkward positions such as lying down, stooping, kneeling and crouching while reaching for and handling parts, assemblies and tools;
- near visual acuity and depth perception when assembling or adjusting mechanical parts and assemblies;
- capacity to work, usually inside, while exposed to loud, intermittent noises from pneumatic wrenches, hammering and accelerating engines;
- adaptability to a variety of physical hazards such as exposure to fumes and dusts, grease and dirt, and working in close proximity to moving mechanical parts.

INTERESTS AND TEMPERAMENTS

Motor vehicle Body Repairers generally require significant interests in, and dispositions for work involving the following:

Interests

- dealing with things and objects of a mechanical nature;
- non-social work, carried on in relation to processes, machines and techniques;
- activities leading to satisfaction from tangible results.

Temperaments

- the precise attainment of set limits, tolerances or standards;
- the evaluation of information against measurable or verifiable criteria to arrive at decisions;
- a variety of duties often characterized by frequent change.

TOOLS AND EQUIPMENT

steel tape and gauges
clamps, belts and/or chains
different hammers and dollies
ratchet & sockets & wrenches
drills & bits
portable grinder & sander
screw drivers and wrenches
hand shears
chisels
leading tools
paddles
body file
putty knife

rack-type frame and body
pressor potable aligning unit
portable type frame and
unitized body straightener
pushing and pulling rams
yacks and fixtures
oxyacetylene torch
holding fixture
power metal cutting tool
electric welder
paint spray gun & air
compressor
wheel alignment rack
& turntables
hydraulic jack
hack saw
sport welder, oxyacetylene
welder

WORKING CONDITIONS

Working conditions in this trade vary from shop to shop. Automobile body shops are noisy because of the banging of hammers against metal and the whirl of power tools. Most shops are well ventilated, but often are dusty and have the odor of paint. Body repairers often work in awkward or cramped positions, and most of their work is strenuous and dirty. Hazards include cuts from sharp metal edges, burns from torches and heated metal, and injuries from power tools.

OCCUPATIONAL TITLE MOTOR VEHICLE BODY REPAIRER

CCDO CODE NO. 8581

A. PHYSICAL ACTIVITIES									
1.0 STRENGTH	Not Pres.	Weight	3.0 BODY DEXTERITY	Not Pres.	Pres.	4.0 MANUAL DEXTERITY	Not Pres.	Pres.	
1.1 Lifting		max 100 lbs.	3.1 Stooping		X	4.1 Reaching-above shoulder			
1.2 Carrying		max 100 lbs.	3.2 Kneeling		X	4.2 Reaching-below shoulder			X
1.3 Pushing			3.3 Crouching		X	4.3 Handling			X
1.4 Pulling			3.4 Crawling		X	4.4 Fingering			X
2.0 BALANCE	Not Pres.	Pres.	3.5 Standing			4.5 Feeling			X
2.1 Climbing			3.6 Sitting			5.0 TALKING			
2.2 Balancing			3.7 Walking			6.0 HEARING			
7.0 VISION			3.8 Reclining			8.0 CONTROLS			
7.1 Normal Vision		X	7.0 VISION (Cont'd)			8.1 Hand-arm			
7.2 Acuity-Near			7.5 Accommodation			8.2 Foot-leg			
7.3 Acuity-Far			7.6 Colour vision			8.3 Eye-Hand-Foot coordination			
7.4 Depth per.			7.7 Field of vision						

B. ENVIRONMENTAL CONDITIONS									
WORK STATION	Inside X	Outside	Isolation	Team Work	Proximity		Supervision Received		
							None <input type="checkbox"/>	Close <input type="checkbox"/>	General <input type="checkbox"/>
WORKING CLIMATE							ATMOSPHERIC CONDITIONS		
		Not Pres.	Pres.	HAZARDS		Not Pres.	Pres.		Not Pres.
C-1 Extreme cold				H-1 Mechanical			X	A-1 Fumes	
				H-2 Electrical				A-2 Odours	
				H-3 Burns			X	A-3 Dusts	X
C-2 Extreme heat				H-4 Explosives				A-4 Mists	
				H-5 Radiation				A-5 Gases	
C-3 Wet/Humid				H-6 Heights				A-6 Poor ventilation	X
				H-7 Dangerous Footing				A-7 Other	
C-4 Noise (80 dbs. or more)				H-8 Other			X		

D. Code	Description of significant physical activities and environmental conditions								
H8	Hazards include cuts from sharp metal edges								

